AACP REPORT

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ADMINISTRATIVE SERVICES

2020 Curriculum Committee Survey of U.S. Colleges of Pharmacy


Objective: Evaluate the status of doctor of pharmacy programs' curriculum committees as an update to the 2008 curriculum committee study. Methods: Survey methods were used. A total of 130 fully-accredited schools and colleges of pharmacy were invited. Data collection occurred between March and September 2020, and requested information about the recently complete academic year (AY19-20). Data were collected on committee membership, leadership, functions, and charges. New items were added to explore ties to assessment and Standards 2016. Analysis included descriptive statistics and comparisons to 2008 results. The study design was approved by both campus IRBs. Results: Response rate was 82%; one partial response was excluded from analysis. Most (93%) schools and colleges rely on a curriculum committee to provide curriculum oversight. Committees are composed primarily of faculty members with voting privileges, but most committees have student (94%) and assistant/associate dean (92%) members too. Over half (53%) have members from other areas including experiential programs, staff, directors, librarians, and PGY1 residents. Twenty-four categories of charges were reported including traditional curriculum planning, mapping, and review plus newer tasks (eg, EPAs, IPEs, PPCP, co-curriculum, certificates). Communication most frequently involved members of curriculum and assessment committees attending each other’s meetings (86%). Primary responsibility for various assessment activities is shared by both committees in 1/3 of institutions. Conclusions: Curriculum committees have increased the diversity of their membership, which is likely due to a growth in the number and scope of charges, increased ties with their respective assessment committees, and new accreditation standards. Curriculum committees remain a key part of pharmacy education.

2020 Rankings for PharmD Programs, Research, and Overall Quality

Lisa Lebovitz, University of Maryland, Eric Boyce, University of the Pacific, Kimberly K. Daugherty, Sullivan University, Margarita DiVall, Northeastern University, Mike Rudolph, University of Kentucky.

Objective: Pharmacy programs are ranked by US News and World Report (USNWR) with only one peer perception measure, but medicine and nursing programs are ranked using quality metrics. The objective of this study was to develop a simple data-driven framework to rank pharmacy schools in educational, research, and overall quality. Methods: Considerations included selecting metrics and data that did not require additional reporting or surveys, testing their appropriateness with factor analysis, and calculating education and research separately to reflect the breadth of pharmacy schools. Data were obtained from AACP, ASHP, and NABP. Quality metrics included total research funding dollars, mean award per faculty, principal investigators on NIH grants, number of PhDs conferred, PharmD student-to-faculty ratio, NAPLEX pass rate, and proportion of PGY1 match. Exploratory factor analysis (EFA) was used to determine whether education and research represented distinct dimensions of quality, and to objectively develop weights for each metric. Final rankings were then calculated and compared to USNWR. Results: EFA models indicated that education and research were separate but moderately correlated quality factors. Correlations were statistically significant and strong between the USNWR pharmacy rankings and the calculated education, research, and overall rankings. A mean difference in overall school rank of 15 positions was observed between the calculated rankings and the USNWR rankings. Conclusions: Using available pertinent quality-based data allows for more frequent rankings, although the calculated ranks may fluctuate more than the USNWR perception-based ranks. Separate education and research rankings highlight the diverse strengths of schools of pharmacy across the academy.

A Pharmacy Readiness Program to Increase Student Success of Admitted Students

Sushma Ramsinghani, University of the Incarnate Word, Paulo Carvalho, University of the Incarnate Word, Adeola Coker, University of the Incarnate Word, Amy

**Objective:** Most failing grades at the Feik School of Pharmacy occur in the P1 fall semester. Admissions data for class of 2022 revealed that students with a product score (PCAT composite score x Math-Science GPA) < 150 had more failing grades in P1 fall than those with a product score >= 150. The objective of this study was to determine if a Pharmacy Readiness Program (PRP) will increase student success.

**Methods:** Twenty-two students selected for PRP attended a week of in-class activities in the summer that simulated a typical week of coursework in the P1 fall semester. Self-help activities, group work, office hours, and tutoring were included. The in-class activities week was followed by six weeks of online activities. **Results:** Of the 20 students that completed PRP and attended P1 fall semester, 16 had product scores <150. Mean GPA in four science courses in P1 fall was used to determine student success. Multiple regression analysis with the mean GPA as dependent variable and the product score, participation in the PRP, being a first-generation student, and belonging to a minority group as independent variables indicated that the product score and PRP participation were statistically significant. For students with product scores <150, the PRP group had statistically higher mean GPAs than the non-PRP group (mean GPA 3.19 versus 2.73, p = .022). **Conclusions:** The study indicates that participation in the Pharmacy Readiness Program positively influenced student success. The product score was a better predictor of student outcomes (mean GPA) than either PCAT score or Math-Science GPA. Furthermore, being a minority or first-generation student did not statistically affect student success.

**A Policy Summit Approach for Developing a Values-based Strategy to Evaluate Academic Policies**

David Fuentes, University of Portland.

**Objective:** Organizations should operate in ways aligned with their organizational values and according to their strategic initiatives. This process has provided the program with a strategy to evaluate, review, challenge, and revise guidelines based on the organizational core values of self-care, social justice, academic excellence, integrity, compassion, and lifelong learning. Here, we present the process to develop the summit, the inclusive nature of the approach, and the strategy developed. **Methods:** The organizational core values were further defined through a shared understanding approach in a series of meetings where students, staff, faculty, and administrators worked in collaboration. Discussions related to mindset and understanding of academic policies allowed the group to identify policies that created tension among stakeholders, identify priorities for policy development and revision to address gaps, and create stepwise approach to evaluating policies using through a policy development committee that will carry on this work moving forward. **Results:** The policies that were most polarizing centered on student progression, examination policies, and how to handle situations with more challenging student behavior. An evaluation process involving the core values was created so anyone in the organization can look for organizational alignment between their actions and the values. The policy development committee was developed, comprising of students, staff, and faculty, to guide future directions and work in policy development as part of the shared governance structure. **Conclusions:** The organization developed processes that would impact academic policy development, review, revision, and implementation. This approach engaged various stakeholders towards greater understanding of policy and promoted transparency and inclusion.

**A Practical Dynamic Inquiry Model to Promote Role Clarification, Healthy Delegation and Succession Planning**

David Fuentes, University of Portland.

**Objective:** Academic leaders must maximize the team’s talent and ensure everyone is using their strengths in their work ensure the organizational needs are met. Dynamic inquiry helps leaders learn through strategic questions. This dynamic inquiry model shares specific questions leaders can immediately ask their direct reports to engage employees at all levels in defining role clarity, promoting a shared understanding of expectations, and creating a vision for the employee's future in the organization. Drawing on the literature and research in career stewardship and succession planning, this poster will share specific tools, their short-term and long-term results, and illustrate the impact on our organization. **Methods:** A literature review on areas of career stewardship, role clarity, succession planning, and relational coordination within the organizational development was conducted. These questions can help initiate guide conversations with employees on role clarity, expectations, career development, growth and motivation, and ongoing performance and potential. A model will show how to engage new employees, how to engage with an existing team as a new leader/manager, and how to start to build a trusting, mentorship connection with colleagues. **Results:** The questions developed contributed to organizational change. The pre-/post- visual of the organizational reporting
structure will be compared. Delineation of roles and responsibilities, based on employee career development goals and organizational needs, will be outlined specifically to serve the needs of other organizations embarking on changing their administrative/organizational structure based on their unique program needs and external forces resulting in a need to adopt change. **Conclusions:** The dynamic inquiry model presented begins meaningful dialogue about how employees can seek clarity in their roles and expectations, and how they can continue to grow in the organization.

**A Programmatic Evaluation to Improve the NAPLEX Pass Rates of Underrepresented Minority Pharmacy Graduates**

Simi Gunaseelan, Texas A&M University Irma Lerma Rangel College of Pharmacy, Amanda Galindo, Texas A&M University Irma Lerma Rangel College of Pharmacy, Amanda M. Galvan, Texas A&M University Irma Lerma Rangel College of Pharmacy, Indra K. Reddy, Texas A&M University Irma Lerma Rangel College of Pharmacy.

**Objective:** To compare and contrast underrepresented minority (URM) pharmacy graduates’ NAPLEX performance with Non-URM pharmacy graduates, as well as determine the strongest predictor(s) of NAPLEX success/failure for URM pharmacy graduates from various academic factors. **Methods:** An IRB-approved systematic examination of NAPLEX scores along with 24 academic factors was performed at Texas A&M College of Pharmacy by disaggregating the Class of 2019 pharmacy graduates data based upon URM group (Hispanic and Black/African American) and Non-URM group (Asian, White and Mixed) classification. Pearson’s correlation and stepwise multivariate linear regression analysis were used to determine the most critical determinant(s) of NAPLEX success/failure for URM pharmacy graduates from the academic factors studied. **Results:** 101 pharmacy graduates were included in the study with URM group comprising 39 graduates (38.6%) and Non-URM group comprising 62 graduates (61.4%). The overall mean (SD) of first-time NAPLEX score of URM pharmacy graduates [91.8 (17.8)] was found to be lower than that of the Non-URM pharmacy graduates [97.5 (11.4)]. First-time NAPLEX score was significantly correlated with multiple academic factors for URM group. The final regression model included PCOA scaled score (Area 4: Clinical Sciences), Pharmacy 3rd semester GPA and PCAT composite score for URM group. **Conclusions:** The findings indicated that PCOA scaled score (Area 4: Clinical Sciences) (accounting for ~47% of variance) and pharmacy 3rd semester GPA (accounting for ~12% of variance) are the most critical determinants and positive predictors of NAPLEX total scaled score for URM graduates. Such strong key indicators may assist colleges/schools of pharmacy (particularly that are dedicated towards creating inclusive climates) in implementing academic success pathways for academically struggling URM students who may be at risk for poorer NAPLEX performance.

**An Evaluation of Novel Non-Academic Predictors of Success in a Doctor of Pharmacy Program**

Monica Mathys, Texas Tech University Health Sciences Center, Charles Seift, Texas Tech University Health Sciences Center, Jennifer Grelle, Texas Tech University Health Sciences Center, Rebecca Mahan, Texas Tech University Health Sciences Center, Molly Minze, Texas Tech University Health Sciences Center.

**Objective:** Pharmacy programs have struggled to predict who would be successful in their programs based solely on cognitive skills. The reduction in pharmacy school applications has led to several programs no longer requiring the Pharmacy College Admission Test for entrance. Therefore, non-academic factors of success may be needed to help admissions committees select the best applicants. The primary objective of this study was to determine whether certain non-academic factors are associated with on-time progression within the SOP curriculum. **Methods:** A survey was developed and offered to all TTUHSC JHH SOP students in Fall 2020. This survey included questions to collect demographic data and incorporated four validated questionnaires that included the (1) Grit Grid, (2) Perceived Stress Scale, (3) Turkish Time Management Questionnaire (TTMQ), and (4) Academic Pharmacy Resilience Scale (APRS-16). **Results:** Completed surveys were submitted by 212 students out of 594 (35.7% response rate). On-time progression rate was calculated separately for each class. Both a TTMQ score above 55 [137/159 (86.2%) vs. 38/53 (71.7%), p = 0.0163] and an APRS-16 score >35 [110/125 (88.0%) vs. 65/87 (74.7%), p = 0.0122] were associated with a higher on-time progression rate. When both the TTMQ score was >55 and the APRS-16 score was >35, 96/106 (90.6%) students were on-time vs. if both the TTMQ score was ≤55 and the APRS-16 score was ≤35 then only 23/35 (65.7%) students were on-time (p = .0021). **Conclusions:** A score above 55 on the TTMQ plus a score above 35 on the APRS-16 was associated with on-time progression within our SOP curriculum. It may be reasonable to implement these two questionnaires in our admissions process to help determine the most appropriate candidates for our program.
Assessment of the Health and Well-Being of Students within a Pharm.D. Program

Daniel J. Hansen, South Dakota State University, Asha Hertler, South Dakota State University, Michelle Sestak, South Dakota State University, Aaron Hunt, South Dakota State University.

Objective: To measure the overall wellbeing of pre-pharmacy and current Pharm.D. students. Methods: A current Pharm.D. Candidate designed a survey designed to obtain a baseline assessment of the overall well-being of pre-pharmacy and year 1 and 2 Pharm.D. students. The survey asked a variety of quantitative and qualitative questions, with a portion of the questions measuring stress levels and stress management techniques. Sleep patterns, nutrition, and exercise were evaluated using a 5-point Likert Scale.

Results: The response rate was consistent amongst the three groups of students (37% Pre-Pharmacy; 23% P1; 40% P2). Aggregate survey results indicated that most students rated daily stress as often (52.1%) or always (30.1%) and rated feeling overwhelmed as often (54.8%) or always (20.5%), with the highest rates observed among P2 students. However, 34.2% reported being unaware of available resources and 65.3% reported never utilizing any services. Several differences were observed between class status and stress management techniques. Pre-pharmacy students were more likely to restrict food intake during times of stress, compared to P2 students (p=.043). P2 students on the other hand were more likely to make poor food choices when dealing with stress, compared to pre-pharmacy and P1 students (p<.05). Finally, P2 students were more likely than a P1 to indicate that a perceived lack of time caused them to make a poor food choice (p<.05). Conclusions: The results of this baseline survey will help support the College’s efforts in developing a wellness program and potentially increase the use of existing services to support all aspects of well-being.

Comparison of Perceived Stress, Academic Self-Concept, and Coping Strategies in Pharmacy Students Following Curricular Revision

Lena Maynor, West Virginia University, Marina Galvez Peralta, West Virginia University, Ashleigh L. Barrickman, West Virginia University, Ahmad Hanif, West Virginia University, Gina M. Baugh, West Virginia University.

Objective: Data regarding the impact of curricular revision on pharmacy students’ perceived stress levels are lacking. The objective of this study was to compare perceived stress, academic self-concept, and coping strategies between pharmacy students prior to and following a major curricular revision and to describe university resources used to deal with stress. Methods: Pharmacy students in the pre-APPE curriculum were asked to complete the Perceived Stress Scale (PSS-14), Brief COPE, and Academic Self-Concept Scale (ASCS) in Fall 2019, following implementation of a revised, integrated curriculum. Scores were compared to student data compiled prior to the revision. Results: Surveys were completed by 220 of 239 students (92%) in 2019 and 243 of 245 students (99%) in 2009. Unpaired Mann Whitney, one-way ANOVA, or Kruskal-Wallis analyses were performed, as appropriate. Correlation values were calculated using Pearson R method. The average PSS-14 score (0-
Critical Thinking Aptitude Test to Predict the Success of Applicants in a 3-year Pharmacy Program.

Arup Chakraborty, Roseman University of Health Sciences, Christopher Hernandez, Roseman University of Health Sciences, David Rawlins, Roseman University of Health Sciences, Helen Park, Roseman University of Health Sciences.

Objective: Pharmacy programs primarily utilized the Pharmacy College Admissions Test (PCAT), which is a standardized, quantitative factor in the admissions process. At our institution, the PCAT is not necessary for students with a bachelor’s degree. Grade point averages and coursework vary extensively across institutions and are also subjective. To circumvent this obstacle, we developed the Critical Thinking Aptitude Test (CTAT) to identify students that are more likely to achieve competency in the pharmacy program and to provide a standardized assessment tool that is administered in a controlled environment. Methods: The office of student affairs collected student performance data in terms of attrition, and the number of reassessments. The performance data were compared with the results from the critical thinking aptitude test (CTAT). The CTAT consists of five multiple-choice questions. The questions include number series, vocabulary, syllogism, problem-solving, and spatial reasoning. Results: In the College of Pharmacy at Roseman University, the students are assessed on didactic course material every two weeks. Students who receive a score of less than 90% can take a reassessment. Students who do not pass the reassessment have the opportunity to complete a final remediation attempt during the summer. When comparing the performance data with the CTAT scores, we found that higher CTAT scores correlate with a smaller percentage of students having to reassess. CTAT scores of 4 and 5 correlate with a smaller percentage of students having to go onto summer remediation. Conclusions: CTAT scores of 4 or 5 are statistically significant in predicting readiness and positive academic performance in a rigorous three-year PharmD program. A similar approach can be beneficial to any academic program, especially those using holistic admissions processes.

Developing an Immersive Virtual Community Pharmacy Activity During COVID-19

Shannon R. Tucker, University of Maryland, Heather Congdon, University of Maryland, Patricia Ross, University of Maryland, Amy Ives, University of Maryland, George Anagnostou, University of Maryland. Objective: The shift to emergency remote teaching during COVID-19 pandemic necessitated moving in-person laboratory activities into a virtual environment. While activities were redesigned to meet course objectives, this meant that first-year students with no prior experience in pharmacy settings would have no hands-on community pharmacy until IPPE rotations. The objective of this project was to create an immersive community pharmacy experience that allowed students to select the appropriate medication from pharmacy shelves during a community dispensing activity within an abilities laboratory course. Methods: The use of virtual reality and 360° tour software were evaluated to determine technologies that could model the community pharmacy space while providing sufficient detail on medication labels to identify a drug and dosage. Products were evaluated on software complexity, license limitations, cost, user restrictions, image use/quality, and usability. After technical review, several demonstrations were created to determine if 360° or static shelf images would approximate the experience of walking through the aisles while allowing the review and selection of medications. Results: A web-based tour of the University of Maryland model pharmacy was constructed allowing students to browse 6-aisles of oral, topical, and aerosol medications and select label information from 150 of approximately 400 products in inventory. This implementation allowed students receiving a prescription to “walk” the virtual pharmacy to “select” a product as a part of an activity worksheet for the activity. Conclusions: Though in-person instruction was not possible due to COVID-19, innovative strategies allowed for a comparable experience through the creation of web-based aisles of the pharmacy and medication selection from community pharmacy shelves. Once back in the classroom, this technology will continue to be useful as a practice tool for community pharmacy dispensing.
Development of a Co-Curricular Certificate Program to Improve Pharmacy Students’ Financial Literacy

Diana J. Patino, St. John's University, Joseph V. Etzel, St. John's University.

Objective: A co-curricular certificate program was developed to address the desire of pharmacy students to improve their understanding of financial concepts and literacy. Additionally, the certificate program was designed to address educational outcomes in Domain 4 of CAPE. Methods: A 3-day series of lectures and workshops was developed and offered to pharmacy students beginning in the Fall 2019 semester. The program was developed in collaboration with an affiliated financial advisory firm, free of any commercialism. The educational modules included: minimizing the impact of student loan debt and other forms of debt, wealth accumulation and protection, budgeting and savings, creating investment portfolios, and retirement planning. At the conclusion of each module and workshop, students were surveyed to evaluate their satisfaction and to determine if module objectives were met. Results: A total of 7 programs of 25 students each have been offered to date. The first 2 programs were live programs but due to the pandemic the remaining programs were offered via distant learning modalities. Nearly 100% of the student participants rated the overall program as either beneficial or very beneficial. Students indicated were appreciative of the modules related to debt management and wealth accumulation and protection. The only suggestion for from the students was that the program could be extended to address further financial concepts. Conclusions: The development of this certificate program has assisted in addressing student’s desire for improving their understanding of financial literacy. As such, the college is working to expand the programming to offer it to other health care students within the college. In response to the student’s desire to be exposed to other financial concepts an advanced certificate program is being developed.

Effectiveness of an Impromptu Writing Assessment Within the Pharm.D. Admissions Process

Daniel J. Hansen, South Dakota State University, Joshua Reineke, South Dakota State University, Asha Hertler, South Dakota State University, Brittney Meyer, South Dakota State University, Teresa Seefeldt, South Dakota State University.

Objective: Examine the utility of an impromptu writing assessment within the admissions process. Methods: The College requires Pharm.D. applicants to complete an impromptu writing assessment, by writing a two-page response to a scenario-based question. Students’ papers are blindly reviewed and rated as pass, marginal, or fail. That result is used as a component of the admission decision. In the P2 year, students complete an advanced writing assignment (AWA), and that rubric contains a professional writing skills section. Impromptu writing assessment data for the 2011-2018 classes (n=572) were compared to performance on the writing-specific portion of the AWA and pharmacy GPA (PGPA) at the end of the P2 year. Results: Only 6.2% (n=22) of students admitted into the program with a score of pass (n=355) on the impromptu writing assessment failed the AWA (<75%). Of those students, 40.9% (n=9) failed the writing-specific portion of the AWA. Students who received a marginal or fail on the impromptu writing assessment (16.1%, n=35) were more likely to fail the AWA compared to those who passed (p=.0001). Of those students, 54.3% (n=19) failed the writing-specific portion of the AWA. Students who did not pass the impromptu writing assessment were significantly more likely to fail the writing-specific portion of the AWA (p=.0008). PGPA was only slightly higher for students who passed the impromptu writing assessment than those who scored marginal/fail (3.41 ± 0.49 vs. 3.21 ± 0.56). This led to a change in the impromptu writing to a pass/fail rubric. Conclusions: Passing the impromptu writing assessment prior to admission appears to be a strong predictor of success on the advanced writing assignment but not overall performance in the program.

Evaluating the Effectiveness of a Pharmacy Pre-Matriculation Program through Multi-Year Comparative Baseline Performances

Simi Gunaseelan, Texas A&M University Irma Lerma Rangel College of Pharmacy, Amanda Galindo, Texas A&M University Irma Lerma Rangel College of Pharmacy, Amanda M. Galvan, Texas A&M University Irma Lerma Rangel College of Pharmacy, Indra K. Reddy, Texas A&M University Irma Lerma Rangel College of Pharmacy.

Objective: To evaluate the effectiveness of a pre-matriculation program (PMP) by comparing pharmacy baseline performances of PMP students with Non-PMP students within three cohorts. Methods: A 6-week summer PMP funded by the THECB Education Grant Program was implemented at Texas A&M College of Pharmacy for three consecutive years (2018-2020). The PMP was specifically designed to improve pharmacy baseline performances of underrepresented and first-generation pharmacy matriculated students. This 6-week program was built using five key content areas (Part I: calculations; Part II: organic chemistry, biochemistry, physiology, and medical terminology) that are considered essential to first-year pharmacy
Evaluating the Impact of Distance Education on A Prematriculation PharmD Preparedness Program

Ashim Malhotra, California Northstate University; Eugene Kreys, California Northstate University, Xiaodong Feng, California Northstate University College of Pharmacy.

Objective: COVID-19 vastly disrupted education across the globe, creating unique challenges for health professions education (HPE) programs, creating a need for long-term evaluation of teaching. Nowhere is this need more urgent than for curriculum associated with interprofessional pre-matriculation programs. Methods: We created an online prematriculation program by adding primers introducing interprofessional education, and cross-disciplinary and inter-disciplinary aspects related to pharmacy school. We conducted a case-controlled, retrospective, single-blinded study analysis comparing learning metrics between 2019 and 2020. The two-week-long virtual program, co-taught by ten faculty members, was offered for six hours daily during the summer of 2020 in the week preceding orientation week for P1 students. Case Based Learning and aspects of Team Based Learning were incorporated to engage twenty-two pre-matriculation students enrolled for our Doctor of Pharmacy program. This virtual program was designed to overcome diversity in prerequisite course content and identify and address gaps in students’ abilities to relate foundational science knowledge with pharmacy subjects. The following subjects were included: cardiovascular, neurobiology, and renal pathophysiology and pharmacology, and skills-based courses such as introduction to simulation, clinical decision making, interprofessional education, and graduate writing. We also included emotional and mental health and resiliency. Mixed method evaluation was used including comparing student perceptions of their learning on a twenty-question survey instrument and comparison of the post-activity quiz data. Results: Seventy-seven percent of the attending students from 2020 agreed and 22 percent strongly agreed that the virtual program helped them connect the dots between pathophysiology and pharmacology and pharmacology and skills-based courses such as interprofessional education. Conclusions: The online pandemic pre-matriculation program was perceived by students to be helpful for reviewing content.

Faculty Development Modeling: A Comparison of Three Minority Serving Institutions

Mohd Shahid, Chicago State University, Miriam C. Purnell, University of Maryland Eastern Shore, Timothy Gladwell, University of Maryland Eastern Shore, Oluwaranti Akiyode, Howard University, Jacquiese Unonu, Howard University, Jeremy Hughes, Chicago State University.

Objective: To compare and contrast the models for faculty and staff professional development and personal growth that currently exist at three PharmD institutions Methods: Faculty and administrators from three minority-serving institutions shared existing professional development strategies for faculty and staff, examining the use of formal programming, mentorship structures, learning communities, university centers of excellence, and other modalities. Developmental opportunities identified through ACPE Standards 18, 19, 20, and 25 were assessed, as were department, program, and university level infrastructure. Data was analyzed and a chart was generated to compare and contrast structured, semi-structured, and informal employee development opportunities at each program. This chart review was then compared back to ACPE Standards and published faculty and staff development models in health professions education. Results: Developmental infrastructure varied between institutions, including oversight, assessment strategies, and level of university involvement. Categories of development at all three institutions tied to university and program mission as well as faculty retention and promotion, though frequency, modality, and emphasis of programming was more specific to the needs and strategic planning of each
organization. Individual program strengths were identified, including internal and external mentorship programs and structured systems to ensure non-clinical faculty understand the pharmacy profession. **Conclusions:** Faculty and staff professional development models at PharmD programs are often not widely known outside of the respective institutions. Collaborations in faculty development programming amongst schools serving underserved and underrepresented students can lead to improved faculty and staff developmental models, by identifying best practices and opportunities for shared programming.

**From Emergency Remote Teaching & Assessment to Building Program Resiliency**

Aleksandra Mejia, *University of Toronto*, Lachmi Singh, *University of Toronto*, Gajan Sivakumaran, *University of Toronto*. **Objective:** Tasked with leading contingency planning in our academic programs due to the COVID-19 pandemic, we set out to ensure that course instructors were provided with sufficient tools and resources to rapidly and successfully pivot in-person course delivery to an online platform. **Methods:** We adapted an existing university course planning template to serve as a multi-functional tool for instructors to reflect and design their approach to online teaching and assessment. We also collaborated with our educational technology team to create a virtual education hub where important resources were made accessible. Once the term was well underway, we evaluated our pandemic response using the Organisation for Economic Co-operation and Development (OECD) Education Response Checklist. **Results:** Faculty completed 22 of 23 course planning templates. An analysis of responses helped inform specific education hub resources (eg, tip sheets, videos, and synchronous virtual drop-in sessions) as well as faculty and staff development. Our post-quality assurance comparison with OECD’s checklist highlighted that we were able to successfully carry out all relevant steps in our emergency education response. **Conclusions:** The course planning template enabled course instructors to identify important needs (eg educational technology, online education and assessment logistics) which informed our decision-making. We will incorporate the course planning template as part of our annual academic planning framework to ensure program resiliency. The OECD checklist, although not designed specifically for professional programs, provided a framework for evaluation and reaffirmed our pandemic education response. The course planning template facilitated emergency planning, structured our education response, identified needs, and provided an opportunity to use new and existing instructional design and technology to successfully transition to online learning.

**Getting Ready with Gatton Ready: An Innovative Approach to a P1 Pharmacy Bridge Program**

Adam C. Welch, *East Tennessee State University*, Marshall Young, *East Tennessee State University*, Michele Williams, *East Tennessee State University*. **Objective:** Determine the effectiveness of a two-week bridge program for incoming P1 pharmacy students. **Methods:** Gatton Ready was required for all incoming P1s and occurred immediately prior to the start of the fall semester. Differing from other bridge programs, Gatton Ready provided actual course content from four of the nine P1 fall semester courses for students to develop their approach to learning in a controlled manner. Concurrent workshop topics included academic success, wellbeing, and student engagement. Effectiveness of the program was defined by comparing the Gatton Ready cohort with a control group comprising of the previous three P1 cohorts. Outcomes included mean P1 fall grade point average (GPA) and number of visits to the Academic Progression Committee (APC, an indicator of non-passing grades). Student attitudes were assessed in two opt-in surveys (early and late in the semester) utilizing a seven-point Likert scale. **Results:** Mean P1 fall GPA for the Gatton Ready cohort (n = 52) was 3.21 compared to 3.13 for the control group (n = 220), with a difference of 0.08 (t-test, p = .37). Mean number of APC visits decreased by 71.9%. Response rates for the opt-in surveys were n = 30 (57.7%) and n = 23 (44.2%) for one and two survey completions, respectively. When asked on the first survey if a student would recommend Gatton Ready to another student, mean response was 6.3 out of 7. **Conclusions:** P1 Gatton Ready participants showed a non-significant increase fall P1 GPA and a decrease in the number of APC visits. Gatton Ready appeared to be well-received per student opinion. Limitations include remote learning due to the pandemic and course-level changes in grading policies versus previous cohorts.

**Identification of StrengthsFinder Signature Themes in Generation Z First Year Doctor of Pharmacy Trainees**

Katherine Aymond, *The University of Louisiana at Monroe*, Jennifer Hoh, *The University of Louisiana at Monroe*. **Objective:** StrengthsFinder is an online assessment that helps students identify their top five strengths (themes). StrengthsFinder capitalizes on talents, rather than developing one's shortcomings. Previous researchers have used StrengthsFinder to identify common themes in millennial pharmacy trainees throughout their didactic, experiential and postgraduate training between 2005 and 2015. Literature has not yet been published to investigate the
Impact of a Post-Graduation NAPLEX-Prep Program on NAPLEX Performance

Matthew R. Dintzner, Chapman University, Reza Taheri, Chapman University, Helen Sahli, Chapman University, Richard Beuttler, Chapman University.

Objective: To determine the impact of participation in a structured post-graduation NAPLEX preparation course on first-time NAPLEX performance. Methods: A Pharmacy Extended Review Course (PERC) was developed using the RxPrep online platform as a structured approach to preparing for the North American Pharmacist Licensure Examination (NAPLEX). Graduates of the 2020 Class of Chapman University School of Pharmacy’s (CUSP) Doctor of Pharmacy (PharmD) program were given the opportunity to participate in the program, which consisted of a detailed schedule for reviewing the entire content of the RxPrep Review Book, along with regular formative and summative assessments. The impact of participation in the program on first-time performance on the actual NAPLEX was assessed compared to that of non-participants. Results: Of the 82 graduates in 2020, 59 (72%) participated in PERC. Of the 59 participants, 41 (70%) passed the NAPLEX on first attempt, 9 (15%) failed, and scores were unavailable for 9 (15%). Of the 23 non-participants, 19 (82%) passed on first attempt, 2 (9%) failed, and scores were unavailable for 2 (9%). The score range for participants was 41-121 (mean = 91.4 ± 18.7), while for non-participants it was 41-118 (mean = 97.8 ± 19.7). When controlling for GPA, PERC participation did not predict significantly impact performance on the NAPLEX. Conclusions: Based on outcomes from one cohort, participation in PERC did not productively impact performance on the NAPLEX. A more longitudinal (year-long) NAPLEX preparation course is currently being explored for implementation in the final year of the program.

Personality Type and Second-Year Academic Performance in a Doctor of Pharmacy Program

Lena Maynor, West Virginia University, Jon Wietholter, West Virginia University, Jennifer Clutter, West Virginia University.

Objective: Multiple factors, including personality, influence academic performance in health professions programs. The personality type of conscientiousness has previously been associated with increased didactic performance. The purpose of this study was to evaluate impact of personality types on measures of academic performance in the second year (P2) of a Doctor of Pharmacy (PharmD) program. Methods: Students entering the PharmD program from 2015-2018 were invited to participate. Participants completed an online DiSC personality assessment to identify a dominant personality type (ie, dominance, influence, steadiness, or conscientiousness). Course grades, P2 fall and spring semester grade point average (GPA), cumulative (P1 and P2 academic years) GPA, and academic sanctions were collected. P2 semester GPAs and cumulative GPA were compared across personality types using non-parametric ANOVA. Differences in academic penalties were compared using the Chi-squared test for independence. Additionally, conscientiousness was compared against all other personality types using the Mann-Whitney test. Results: A total of 304 of 318 eligible students (96%) participated. No differences in performance were found in P2 semester GPAs and cumulative GPA when directly comparing all four personality types. However, students exhibiting conscientiousness as the dominant personality type had significantly higher P2 fall semester GPA (3.24 vs 3.03, p = .01) and cumulative GPA (3.45 vs 3.32, p = .04) compared to other personality types collectively. No differences were found in incidence of academic sanctions across groups. Conclusions: P2 students exhibiting a dominant personality type of conscientiousness achieved a higher P2 fall semester and cumulative GPA. This finding is consistent with published data for other health professions students. A better understanding of the implications of personality may impact early identification of students that may be at academic risk.
Pharmacist’s Skills and Exploring Nontraditional Pharmacy Careers

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Objective: The objectives are to (1) discuss the technical and non-technical skill sets that pharmacy students acquire at graduation, (2) describe nontraditional careers that the students may consider, and (3) discuss the strategies to educate faculty on nontraditional employment opportunities.

Methods: Data were gathered from the ACPE accreditation standards, the U.S. Bureau of Labor Statistics, the AACP Graduating Student and Alumni Surveys and the literature to determine a broad range of skills that pharmacy graduates acquire through curricular and co-curricular learning. Using a modified Delphi method and an iterative process of building consensus, authors developed a list of translational skills and nontraditional positions for PharmD graduates. Strategies for how to implement and educate faculty and students for nontraditional positions were discussed.

Results: The most sought-after skills by employers include creativity, persuasion, collaboration, adaptability, and emotional intelligence, corresponding to the ACPE Standards 3 and 4. Underexplored positions for pharmacy graduates include research in pharmaceutical or biotechnical industry, medical affairs, and regulatory affairs. Nonprofit association management; federal, state, and regional health organizations; supply chain and distribution management; quality improvement in health systems; and entrepreneurial consulting are also potential employment areas. The COVID pandemic and the opioid crisis have opened opportunities in public health, substance abuse treatment, telemedicine/telehealth, and immunization. Artificial intelligence, pharmacogenomics, and digital disruption of care delivery are impending. Pharmacy programs train students with the skills needed for these positions through curricular and co-curricular activities.

Conclusions: Students must become aware of the opportunities existing in both traditional and nontraditional pharmacy careers and be able to harness the translational skills from their training. Programs and faculty may educate and prepare supportive strategies of translating students’ comprehensive skills to tangible job acquisition.

Predictors of Participation in a Licensure Preparation Course

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Objective: The objective of this study was to determine factors associated with students’ self-selection into a structured post-graduation NAPLEX-preparation course. Methods: A Pharmacy Extended Review Course (PERC) was developed using the RxPrep program. Students were given the opportunity to participate in a voluntary accelerated track (8 weeks) or standard track (12 weeks) based on their performance in the program. To identify potential factors associated with this voluntary participation, ten variables were analyzed in a logistic regression model to determine which were associated with PERC participation. Due to possible correlations between the variables, lowest Bayesian Information Criterion (BIC) logistic regression algorithm was used to find variables with the best fit for predicting participation. Backward elimination was then used to eliminate any variables that did not add significantly to the model.

Results: Of the 82 students in the graduating class of 2020, 59 (74%) participated in PERC program. Two of the ten variables analyzed as potential predictors for PERC participation, had a statistically significant predictive value for participation. Lower pre-NAPLEX scores (p = .002) and being part of the Freshman Early Assurance Program (p = .044) had a statistically significant predictive value for participation in the PERC program.

Conclusions: It was initially hypothesized that, given the option to participate, academically strong students would do so. To our surprise that was not the case. Lower pre-NAPLEX score as a strong predictor for self-referral to this program may suggest self-awareness of the need for support. Assessing impact of this program on NAPLEX performance is warranted in future studies.

Survey of Pass/Fail Grading Systems in US Doctor of Pharmacy Curricula

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Objective: To understand how colleges and schools of pharmacy utilize pass/fail grading systems in Doctor of Pharmacy curricula and how that may contribute to understanding and adoption within and beyond the academy. Methods: An electronic survey was developed and distributed to the 10 academic pharmacy programs known...
to utilize a pass/fail grading system in 2020 to gather qualitative and quantitative data. **Results:** Programs varied regarding the types of courses (didactic, lab, skills, experiential, etc.) for which they utilize a pass/fail grading system and whether numerical scores are shared with students. A variety of grade designations (honors, pass, no pass, fail, satisfactory, etc.) are used, and the minimum pass level varies by program, ranging from 70% to 90%. For those institutions that utilize post-course remediation, the majority of remediation occurs immediately following the academic term or in the summer. The type of information shared with residency program directors (GPA, class rank, overall percentile, qualitative comments, etc.) varies among pass/fail programs. **Conclusions:** The lack of a consistent approach to pass/fail grading systems may be what causes confusion and hesitancy to adopt this model, leading to the overall lack of adoption across the pharmacy academy. Programs that utilize a criterion-based grading system might benefit from engaging in future conversations with one another to determine if and how consistency might be realized among terminology, passing level, percentages, grade point averages, and progression. Additional insights on post-graduate training requirements and honorary societies is warranted should pass/fail grading expand as it has in medical education.

**The Effects of Resilience on Burnout and Academic Performance Among First-Year Students During a Pandemic**

Brent N. Reed, University of Maryland, Lisa Lebovitz, University of Maryland, Cherokee Layson-Wolf, University of Maryland.

**Objective:** We examined whether student resilience predicted burnout and academic performance at the end of a high-stress period—the first semester of pharmacy school in an entirely online environment during a pandemic. **Methods:** First-year students (n=108) were surveyed at the beginning and end of fall 2020 to assess resilience (Connor-Davidson Resilience Scale) and burnout (exhaustion and disengagement; Oldenburg Burnout Inventory). Students also reported adequacy of sleep and nutrition and time spent on self-care activities. Students were informed about self-care and were provided with resources, but no additional interventions were performed. Our primary analysis was whether resilience and self-care behaviors predicted burnout and grade point average (GPA) at the end of the semester. Data were analyzed using linear regression in SPSS v.26. The study was deemed exempt by the institutional review board. **Results:** Resilience scores were lower than adult norms but comparable to other health professional students. Older age was a positive predictor of resilience whereas nonwhite race/ethnicity predicted lower scores (both \( p<.05 \)). Exhaustion and disengagement scores met thresholds for burnout at baseline and worsened by the end of the semester (\( p=.039 \) and \( p=.006 \), respectively). Resilience was associated with lower exhaustion, but this effect disappeared when controlling for race/ethnicity; self-reported nutrition was the only behavior that predicted lower exhaustion (\( p=.003 \)). Resilience was associated with lower disengagement even after controlling for race/ethnicity (\( p=.018 \)). None of the variables we tested predicted GPA. **Conclusions:** Burnout may emerge long before entry into the profession. Although resilience appeared to be protective, its effects were at least partly explained by immutable factors such as age and race/ethnicity. The latter suggests that providing support to younger students and students of color may be more beneficial than promoting self-care.

**The Relationship Between a Multiple Mini-interview and Situational Judgement Test for Admissions**

Wendy C. Cox, University of North Carolina at Chapel Hill, Faustina T. Hahn, University of North Carolina at Chapel Hill Eshelman School of Pharmacy, Michael D. Wolcott, University of North Carolina at Chapel Hill, Jacqueline McLaughlin, University of North Carolina at Chapel Hill.

**Objective:** To explore the relationship between a multiple mini interview (MMI) and situational judgement test (SJT) designed to evaluate non-academic constructs. **Methods:** A 30-question ranked-item SJT was developed to test three constructs also measured by MMI during the School’s admissions process: adaptability, empathy, and integrity. First year pharmacy students were invited to participate in the study in Fall 2020. The SJT was administered via Qualtrics at the end of an orientation session. One hundred and four students took the SJT (82.5% response rate) with 97 having MMI scores from the admissions process. Descriptive statistics (mean \( \pm \) standard deviation), Concordance analysis, Spearman’s correlation, Cronbach’s alpha, and principal components analysis were used to explore the psychometric properties of the SJT and its relationship to MMI scores. **Results:** Seventy-four percent of students identified as female (\( n=72 \)) and 11.3% identified as an underrepresented racial minority (\( n=11 \)) with an average age of 21.8\( \pm \)2.1 years. Students averaged 85.5\%\( \pm \)3.1 (out of 100 points) on the SJT and 6.1\%\( \pm \)1.0 on the MMI. Principle components analysis indicated that the SJT lacked construct validity (ie, factored into more than the three constructs intended) and internal reliability (ie, \( \alpha<.4 \) for each construct). However, reliability of the entire SJT instrument provided support for using the total SJT score for analysis (\( \alpha=63 \)). Correlations between total SJT and MMI scores were weak (\( p<.29 \)). **Conclusions:** Results of this study
suggest that the SJT may not be a good replacement for the MMI to measure distinct constructs during the admissions process. The SJT may provide useful information in addition to the MMI during admissions or as part of formative feedback once students are enrolled in a program.

**Understanding Postdoctoral Experiences and Identifying Opportunities for Improvement**


**Objective:** Although postdoctoral trainees play a vital role in pharmacy and pharmaceutical sciences, their experiences remain largely unexplored and under-researched. The objective of this study was to answer the question "What are postdoctoral experiences at the UNC Eshelman School of Pharmacy?" and identify opportunities for improvement.

**Methods:** Qualitative methods with purposive convenience sampling were used to recruit participants for 60-minute focus groups in 2020. Data were collected from postdoctoral trainees in Clinical Research (n=12), Bench/Basic Research (n=4), and Education/Academic Research (n=4) during 5 focus groups and from postdoctoral faculty mentors in Clinical Research (n=3), Bench/Basic Research (n=4), and Education/Academic Research (n=1) during 2 focus groups. Transcripts were coded inductively by two researchers independently. **Results:** Trainees believed they gained relevant knowledge, skills, and professional development in their postdoctoral programs. While acknowledging strong support from mentors, they also expressed interest in additional professional development related to networking with alumni, alternative career pathways, and interdisciplinary collaboration. Mentors highly valued the trainees, believed their programs trained mentees for common career trajectories, and advocated for additional infrastructure to support the postdoctoral community. Trainees and mentors recognized the various needs and interests of trainees given the wide range of research foci across the School. For example, Clinical and Education/Academic Research trainees more frequently indicated an interest in more postdoctoral community engagement compared to Bench/Basic Research trainees. **Conclusions:** These findings support other studies that describe various factors influencing postdoctoral experiences, including mentoring, career development, and postdoctoral community engagement. Given the wide range and foci in pharmacy and pharmaceutical sciences, more research is needed to fully understand how to optimize these programs.

**What is Known About PCOA? A Scoping Review of the Pharmacy Curriculum Outcomes Assessment**

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**Objective:** This scoping review sought to identify themes and gaps from published literature regarding the Pharmacy Curriculum Outcomes Assessment (PCOA) to inform practice and additional areas for research within the Academy.

**Methods:** A five-phase procedure was utilized to answer the question, “What has been published regarding the PCOA?” PubMed, EMBASE, Scopus, and pharmacy education journals were searched for terms related to the PCOA. Identified articles underwent a two-stage, dual-reviewer screening process to exclude non-original research, conference abstracts, articles that did not evaluate PCOA as main objective, and non-English articles. Data extraction consisted of categories related to article demographics, objectives, results, and “other” given the heterogeneity of included articles. **Results:** After de-duplication, 27 articles were screened; 23 of which underwent full-text screening, yielding 19 articles for analysis. Four themes were identified including administration and use (n=5), resource investment (n=1), student predictors of performance (n=7), and PCOA as a predictor of future performance (n=8). Publications prior to Standards 2016 mainly described administrative practices, whereas recent literature focused on predictive models of PCOA performance and use of PCOA to predict future success. The methods utilized in the predictive models, including variables assessed, were inconsistent, however, limiting the feasibility for robust aggregate analysis. **Conclusions:** While published literature focused on similar themes, no study’s objective aligned with the defined intent of the PCOA by National Association of Boards of Pharmacy: tracking student performance throughout the curriculum, benchmarking programs against other programs, and evaluating achievement of desired programmatic outcomes. The Academy would benefit from consensus of PCOA utility, updated assessment of required resources, and evaluation of its ability to measure curricular effectiveness and/or student performance.

**BIOLOGICAL SCIENCES**

**Development of an Open-Access Pharmacogenomics Patient Case Repository for Pharmacy Educators**

Objective: In recognition of the need for pharmacogenomics teaching resources, the AACP Pharmacogenomics Special Interest Group (SIG) created an open-access repository of pharmacogenomics patient cases and a standardized process for submitting new ones. Methods: A needs-assessment survey was administered to AACP members regarding the needs for, and optimal structure of, educational pharmacogenomics patient cases. We developed a standardized case template based on the Pharmacists’ Patient Care Process (PPCP) that could be customized to faculty needs. Sample cases were created for three generic drug pairs with established clinical guidelines to inform classification tags that could be used to differentiate cases within the repository. We then explored options for open submission of additional cases to the repository by interested faculty. Results: The needs-assessment survey revealed that a pharmacogenomics patient case repository would be helpful across the pharmacy school curriculum and post-graduate training. Interdisciplinary teams of pharmacy educators wrote example cases CYP2C19/clopidogrel, CYP2C19, CYP2D6/SSRIs, and CYP2D6/codeine, which were then reviewed by the entire pharmacogenomics case subcommittee. Patient case questions directly correspond to the different steps of the PPCP. The cases were organized in the AACP Pharmacogenomics SIG Connect library by several classification tags, including complexity (introductory, intermediate and advanced), drug, gene, phenotype, and therapeutic area. Future case submissions will be peer-reviewed by Pharmacogenomics SIG members in collaboration with pharmacy students prior to publishing in the AACP Connect Pharmacogenomics SIG library. Conclusions: An open-access repository of pharmacogenomics patient cases is a valuable educational resource that will reinforce the PPCP while also supporting the integration of pharmacogenomics within pharmacy school curriculum. Use of pharmacogenomics patient cases in curricula will facilitate learner attainment of genomics competencies for pharmacists. All authors contributed equally with additional PGx-subcommittee members.

Highly Reactive Isolevuglandins Promote Inflammation-mediated Atrial Fibrillation

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Objective: Inflammation and oxidative stress are widely recognized to contribute toward the pathogenesis of atrial fibrillation (AF). Oxidative stress-related injury is mediated in part through highly reactive products of lipid peroxidation such as isolevuglandins (IsoLGs). We hypothesized that IsoLGs promote inflammation-mediated AF and that scavenging IsoLGs would reduce AF susceptibility in mice.

Methods: Mice deficient in the lymphocyte adaptor protein (Lnk-/−), a negative regulator of cytokine signaling, display systemic inflammation and oxidative stress. Upon weaning, male Lnk−/− mice were treated with vehicle, a potent IsoLG scavenger (2-hydroxybenzylamine [2-HOBA], or an ineffective IsoLG scavenger (4-HOBA). Between 14-16 weeks of age, mice received transesophageal burst pacing for induction of AF, after which, the atria were processed for flow cytometry and morphological analysis. Results: Compared to wild-type littermate (WT) controls, Lnk−/− mice demonstrated a significant increase in AF burden (121.0±40.4 vs 47.0±39.2 sec [mean±SEM, n=30, 17; P<.05 by Mann-Whitney]) which was reduced by 2-HOBA treatment (47.6±41.2 sec [n=17; P<.05]). Notably, the ineffective scavenger 4-HOBA had no effect on the AF burden in Lnk−/− mice (145.2±91.3 sec [n=7; P>.05]). Immunofluorescence staining with an anti-IsoLG lysyl antibody (D11 ScFv) revealed an increase in IsoLG-adducted proteins in the Lnk−/− atria which was prevented by 2-HOBA. Furthermore, compared to WT controls, Lnk−/− mice displayed a significant increase in CD3, NK1.1, CD19, and CD11b/MHCII positive atrial immune cells in addition to a two-fold increase in IsoLG-adducts within NK1.1 and CD11b/MHCII positive cells. Conclusions: IsoLGs are key mediators of inflammation-mediated AF. IsoLG scavengers may represent a novel therapeutic strategy for the treatment of AF.

Impact of Mnemonics Use on Students’ Knowledge Retention and Clinical Application in a Pharmacology Course

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Objective: Pharmacy graduates need to remember crucial facts about medications for application into clinical settings, which consumes significant amounts of working memory (ie, cognitive load). Mnemonics (memory aids) are used to reduce cognitive load and facilitate learning and
Mnemonics (n = 18) were developed and used in a course covering topics in endocrine and autonomic pharmacology. An anonymous survey on the impact of mnemonics' use was included in the final course evaluation. Using a Likert scale, students were asked to rate the impact of mnemonics' use on their knowledge retention, clinical application, critical thinking, reduction in anxiety while learning, and increased confidence while answering questions on exams. Results: The survey findings (85% response rate; n = 56) indicated that 98.21% of students perceived mnemonics' use improved their ability to retain knowledge and apply information in clinical scenarios. 89.29% of students indicated mnemonics helped them think critically while answering exam questions. In addition, 96.43% and 80.36% of students reported increased confidence during test-taking and reduced anxiety while learning with mnemonics' use. Conclusions: Our study suggests that mnemonics' use in pharmacology courses is perceived positively by pharmacy students. Mnemonics' use might not only help improve students' knowledge retention, application, critical thinking, and confidence while test-taking but also lower anxiety while learning pharmacological concepts. Future studies will correlate students' perceptions of mnemonics' use with exam performance in subsequent pharmacotherapy courses and help address whether mnemonics' use leads to improved exam performance, knowledge retention, and clinical application skills.

Implementing Effective Practices for Teaching Pharmacology using Multimedia, Organized Slide Design, Retrieval Practice, and Gamification

Noa Valcarcel, The University of Mississippi, Nicole Ashpole, The University of Mississippi.

Objective: Courses such as pharmacology often cover large amounts of foundational material in lecture format. We implemented a dynamic lecture approach to re-develop a pharmacology course to enhance student engagement, understanding, and long-term learning. Methods: Dual coding (use of verbal and visual cues to convey an idea) is essential to explain mechanisms of action. We developed multimedia content such as animations; mechanistic diagrams; live sketch-noting; and visual exercises/worksheets, as well as used media clips related to the content (eg, from TV show Grey’s Anatomy) for engagement and critical analysis of “real world” scenarios. Scaffolding or breaking down content into smaller pieces or “chunks” of information reduces cognitive load and enhances retention. Our slides were designed to reflect content chunks using sections, section headers, content path indicators, and other best practices of slide design that facilitated cognitive processing. Guided note-taking reinforced content structure and emphasize key points. To consolidate learning, retrieval practice was used in different formats: practice problems, visual puzzles, crossword puzzles, QR-code apps. Student evaluations and grade average was used to evaluate the efficacy of these methods. Results: Implementation of these practices resulted in improved student evaluations (average from 95.6% to 98.6%), and comments referred to the usefulness of retrieval strategies and organization of the content; as well as a 1.7 percent point increase in the class average. Conclusions: Use of multimedia elements, clearly structured presentations, and a variety of methods for retrieving information are tools that can increase student engagement and learning. This work presents practices that can be easily implemented in pharmacology courses and have a great impact in facilitating student learning and, from the instructor point of view, made the transition to online teaching smoother.

Modulation of Hepatic Drug Metabolizing Enzyme Activity in Rats by Dietary Doses of Honokiol

Fawzy Elbarbry, Pacific University Oregon, Nicholas Moshirian, Pacific University Oregon.

Objective: We have previously demonstrated that exposure of Spontaneously Hypertensive Rats (SHR) to dietary doses of Honokiol (HON) results in resistance to the progressive rise in blood pressure in this rat model. The objective of this study was to investigate the potential effect of these dietary doses of HON on drug metabolizing enzymes in SHR. Methods: Rats (4 groups, 8 animals/group) were treated for 2 weeks with HON (0, 5, 20, and 50 mg/kg) administered by intraperitoneal daily injections. At the end of treatment rats were euthanized, followed by preparation of liver microsomes and cytosols. The activity of the following cytochrome P450 (CYP) enzymes were measured in hepatic microsomes using specific probe substrates: CYP1A1, CYP1A2, CYP2B1/2, CYP2C9, CYP2E1, and CYP3A4. Cytosolic fraction was utilized to measure total glutathione (GSH) level and activity of the following antioxidant enzymes: GSH-reductase (GR), GSH-peroxidase (GPx), GSH-S Transferases (GST), Superoxide dismutase (SOD), and Catalase. Results: The high dose HON treatment resulted in a significant inhibition of CYP1A2 and CYP2B1/2 activities. No effect of HON was observed on the rest of the studied CYP enzymes. On the other hand, both low and high doses of HON resulted in a significant induction of both hepatic glutathione level and activities
of SOD, and Catalase. Only the high dose HON induced the activities of hepatic GST, GR, and GPx, to a significant effect. **Conclusions:** Dietary doses of HON have the potential to offer chemoprevention by stimulating the endogenous antioxidant systems and inhibiting CYP enzymes involved in bioactivation of procarcinogens.

**Pandemic Preparedness: Development of an Elective Course on Infection and Immunity**

Manas Mandal, Roseman University of Health Sciences.

**Objective:** The objectives for the elective course were to 1) fulfill an unmet educational need on coronavirus infectious disease 2019 (COVID-19), 2) to support and continue student’s virtual learning and 3) provide an alternative to attending in-person introductory or advanced pharmacy practice experience (IPPE/APPE). **Methods:** Institutional closure due to COVID-19 pandemic triggered an acute and unmet need that led to the development of a course on infection and immunity focusing on COVID-19 pathophysiology, detection, treatment, immune response and vaccines. In absence of standard textbook, databases such as medRxiv and bioRxiv (pre-print servers for health sciences and biology), PubMed, and Google Scholar were searched using keywords for COVID-19 and the infectious agent SARS-CoV-2. **Results:** Challenges associated with rapid development of a course without previous knowledge required constant learning, filtering out the noises, and retaining the critical and major information essential information for the students who would engage in patient treatment, counseling and immunization efforts. The virtual course was 3-week long with 2 hours of didactic teaching and 1 hour of active learning consisted of quiz and team activity every day. Weekly journal club focused on clinical articles on immune response, various attempted treatments (hydroxychloroquine, remdesivir, convalescent plasma) and tests. The final week was devoted to various vaccine development approaches and group presentations. Twelve students were enrolled, personal communication and a survey showed high degree of satisfaction with suggestions for improvements. **Conclusions:** An innovative and strategic thinking can develop an urgently needed course to close the knowledge gap and equip the students. Updated information on various vaccine formulations, COVID-19 variants and vaccine-induced immune protection will constitute improvements of the elective course.

**Perception of Educational Practices in a Changing Reality**

Marina Galvez Peralta, West Virginia University, Ashleigh L. Barrickman, West Virginia University, Ahmad Hanif, West Virginia University, Kazuhiko Kido, West Virginia University, Mohammed Nayeen, West Virginia University, Chris Terpening, West Virginia University.

**Objective:** To identify best educational practices among multiple instructors and disciplines in an integrated system-based cardiology course and contrast second-year pharmacy students’ perceptions and preferences in virtual teaching with prior modalities **Methods:** Different educational interventions were designed and offered by instructors, including: summary tables, fill-in-the-blank worksheets, readings, mini-cases, choose your own adventure, and real-time audience responses among others. Anonymous surveys were offered at the end of the course in fall 2017, 2018, 2019 and 2020 to assess students’ perceptions on the utility of different educational tools, learning, engagement, and self-perception of knowledge gains. Statistical analysis used Chi-square analysis (Prism 7.0) **Results:** Students’ top preferences for educational tools did not change when compared pre-COVID: summary tables provided by instructors, practice exercises, poll questions, hands-on activities and labs. Over the years, students revealed no significant differences in retrospective pre- and post-self-confidence in discussing cardiology with other healthcare professionals. Interestingly, students’ perceptions of the utility of assigned textbooks have significantly progressively decreased over time, from 61% to students considering useful-very useful in 2017 to less than 12% in 2020 ($p<.0001$). A new educational approach is the use of short recordings as pre-class material. Pre-pandemic, students preferred to watch videos without the instructor’s face, but in 2020, 42% of students preferred to see instructor’s face ($p<.0001$). More students are attending optional review sessions than in the past ($p = .02$), and students feel that review sessions should provide more direct reviews as opposed to responding to student questions. **Conclusions:** Despite the changes on students’ perception of the utility and different educational tools, virtual teaching methods were able to meet students’ needs and produce self-perceptions of learning similar to pre-pandemic.

**Smoking and Vaping Lead to Increased Severity of COVID-19 and EVALI Beside Compromised Health**

Wasana K. Sumanasekera, Sullivan University College of Pharmacy & Health Sciences, Karen Bui, Sullivan University College of Pharmacy and Health Sciences.

**Objective:** Today COVID-19 is a global health crisis and millions of lives were lost due to this pandemic. As this deadly disease invade the globe, scientists searched for risk factors for developing severe outcomes of the disease. The objective of our study is to answer the research question,
whether smoking and vaping cause severe outcomes of COVID-19. This research also emphasizes e-cigarette or vaping product use associated lung injury (EVALI). **Methods:** Data Sources: Literature relevant to the topic were extracted using resources including PubMed, Web of science, Center for Disease Control, and FDA web site. The information related to Smoking and COVID-19 was collected till June 2020. Study Selection: The following criteria were used to select studies for detailed review. They were 1). type of research article 2). legitimacy of the article 3). indexed in a valid search engine and 4). Direct relevancy of the literature to the topic. Data Extraction: The literature that discussed addictive potential and health effects of nicotine; cigarettes, e-cigarettes, and other vaping methods on progression of COVID-19 and EVALI; were included in this review. The other underlaying causes and pathology for COVID-19 and EVAL-1 were excluded. **Results:** The collected information was summarized and presented in this qualitative, narrative review-based research. Recent evidence suggest that a relationship exists between cigarette smoking and EVALI as well as the progression of the current pandemic, COVID-19. There is also a possible relationship between e-cigarette use/vaping and the severe outcomes of COVID-19. **Conclusions:** Due to the observed toxicity and health concerns and the potential association of smoking and vaping with the current COVID-19 pandemic, the people should avoid using cigarettes, e-cigarettes, and other vaping products.

**CHEMISTRY**

**Active Facilitation of Virtual Medicinal Chemistry Active Learning Assignments Using Advanced Zoom Features**

Mudit K. Singhal, D’Youville College.

**Objective:** Active student participation is critical to the delivery of medicinal chemistry components of the pharmacy school curriculum. Carefully structured active learning strategies can promote student engagement while increasing course material application. Topic-based active learning assignments can be administered, where learners apply constructed knowledge and skills to complete assignments. The suspension of on-campus classes due to the COVID-19 pandemic prompted the development of innovative ways to deliver active learning assignments without using the school’s physical team rooms. **Methods:** To actively engage learners, the Zoom video teleconferencing platform with breakout rooms was used to conduct medicinal chemistry active learning assignments in a Pharmacotherapeutics IV: Endocrinology course. Two team activities were planned, one covering the diabetes section of the course and other on male and female sex hormones. The students’ assignment scores in 2020 were compared to those from 2018 and 2019, when the assignments were conducted on campus using team rooms. **Results:** The class average scores showed no significant difference when assignments were conducted virtually using Zoom breakout rooms versus on campus, suggesting successful virtual administration of the assignments. The student satisfaction survey also suggested an overall positive attitude towards the Zoom experience. Instructor-led active facilitation appears to work well in both on-campus and virtual settings to promote student engagement and inclusion. **Conclusions:** Advanced Zoom features were used to engage students in an active learning environment. Most notably, Zoom’s breakout rooms aided in the staging and real-time facilitation of team assignments, promoting a higher level of cognitive learning. This approach of combining live Zoom lectures with actively facilitated assignments completed in Zoom breakout rooms can be successfully employed in other courses to encourage dynamic student participation.

**Adapting PharmD Chemistry Teaching Pedagogy for a Foundational Cannabis Chemistry Course for MS Students**

Chad Johnson, University of Maryland, Andrew Coop, University of Maryland, Ryan Pearson, University of Maryland, Leah Sera, University of Maryland, Shannon R. Tucker, University of Maryland, Lisa Finn, University of Maryland.

**Objective:** To adapt medicinal chemistry, pharmacology, and pharmacokinetics PharmD content to develop a foundational graduate-level cannabis chemistry course for the Masters in Medical Cannabis Science and Therapeutics (MCST) program. **Methods:** As the first program of its kind, the MCST program attracts a diverse student population from various disciplines, including science, health professions, social sciences, and humanities. The lack of consistent experience in hard sciences required creating a course accessible to all and established foundational understanding of foundational chemistry concepts required by employers in the cannabis industry. Core performance objectives were developed by conducting expert interviews with professionals in the cannabis industry. Two faculty members with differing expertise—a medicinal chemist and expert in drug formulation used these objectives to identify foundational concepts from Medicinal Chemistry, Pharmacology, and Pharmacokinetics courses in the PharmD program that would be accessible to non-experts. By focusing on competencies desired most by employers accessible to broad audiences, this resulted in a level of material coverage that was vastly different when compared to chemistry.
delivered in the PharmD curriculum. **Results**: Course content focused on fundamental chemistry to analyze physico-chemical properties of cannabinoids and how it applies to the design of dosage forms for delivery. Many concepts were new to the students, which is not seen with PharmDs. Analysis of student feedback was positive, indicating that the level of the course was suitable. **Conclusions**: Diverse skill sets of faculty and consultation with employers are needed for the effective development of online science MS courses. Analysis of the student cohort's background helped select the course's appropriate level and proved to be vastly different from those in the PharmD program.

**Annotation is Critical for Chemistry Education, but How Do We Do It At a Distance?**

Andrew Coop, University of Maryland, Shannon R. Tucker, University of Maryland, George Anagnostou, University of Maryland, William McLean, University of Maryland, Jerry Adney, University of Maryland, Steven Fletcher, University of Maryland.

**Objective**: The COVID pandemic led to the increased use of personal computers to deliver educational content virtually, yet faculty possess laptops with a range of annotation capabilities. Although drawing tools are available within PowerPoint, the feedback from chemistry faculty was that the resolution was not to a level required for drawing chemical structures. **Methods**: A range of external devices were identified and trialed for ease of use and capabilities with a range of laptops and operating systems. The assessment included the quality performance during remote courses with both Webex and Zoom, as well as for pre-recorded lectures. **Results**: One device gave a very easy to use experience and provided a second annotation enabled display to both PC and Mac platforms, and that device was adopted as a recommended device. Faculty who subsequently used the device reported a positive experience, and appreciated the adoption of a standard that would be supported. **Conclusions**: A consistent technical approach was developed, and was well received by faculty. Unlike other solutions that exist, being an external device, this display was also easily shared as the need for annotation arose. The increase in distance education means that such standardization with a range of personal devices will become even more critical as we enter the post-COVID world.

**B.I.N.G.O! Utilizing Educational Games in a Medicinal Chemistry Course During COVID Pandemic to Engage 'Zoomers'!**

Ola Ghoneim, Western New England University, College of Pharmacy and Health Sciences.

**Objective**: No doubt that COVID-19 had its impact on the teaching/learning process. Instructors were forced to find alternative ways beyond the physical classroom to engage new learners “Zoomers”, who opted/required to learn remotely via popular platforms such as Zoom. Our objective is to utilize educational games such as BINGO as a formal assessment tool, before major exams in a medicinal chemistry course, to enhance students' engagement, especially Zoomers! **Methods**: Rules were posted for classroom students (A) and Zoomers (B) before game day. Random bingo cards were provided (A) or emailed out (B) on game day. Students could play solo/team, with one/more card to increase chances of winning. Cards contain 25 squares with potential answers for bingo questions. Questions could have multiple correct answers. Bingo questions were presented as a PowerPoint on the shared Zoom screen. All students (A & B) have 30 seconds/question. Student/team shout out BINGO when finishing one line in any direction. Questions’ number must associate with answers for valid bingo claims. Winners win real prizes (candy and coffee cards). A questionnaire was sent out to all students to gauge feedback. **Results**: Questionnaire was sent out to all learners following BINGO day (4 Likert-scale questions and one open-ended question). 100% of participants indicated that they were engaged, had fun playing, benefited from materials presented, and preferred it over traditional review sessions. 96.2% liked overall design, interactive competition, and the fun way to study. Game questions, designing bingo cards, and rules of the games will be presented. **Conclusions**: BINGO educational game adds a fun engaging competitive element to the learning process, and facilitate Zoomers’ interaction other than traditional classroom methods, especially in dry courses such as medicinal chemistry.

**Differences in Educational Approaches Required for a Cannabis Analytical Chemistry Course: MS vs. PharmD**

Andrew Coop, University of Maryland, Maureen Kane, University of Maryland, Chad Johnson, University of Maryland, Leah Sera, University of Maryland, Lisa Finn, University of Maryland, Shannon R. Tucker, University of Maryland.

**Objective**: The MS in Medical Cannabis Science and Therapeutics has students with diverse backgrounds, and the aim was to develop an analytical chemistry course that was rigorous, met outcomes needed by employers, yet accessible to all. The student body is diverse and many do not have the same educational background as PharmD students, so it was critical to assess the differences required when adapting to teach chemistry in such a program. **Methods**: Interviews with experts from the cannabis industry led to terminal
outcomes. Many students had little, if any, science background and the course was developed from the outcomes by faculty with diverse skill sets. A medicinal chemist and an expert in analytical chemistry collaborated to build from foundations that would be understood by a non-expert, especially the difference in teaching required compared to chemistry delivered in the PharmD curriculum. Results: The course content focused on fundamental chemistry to allow application to state-of-the-art analytical techniques used in the cannabis field, namely chromatography, mass spectrometry, and (to a smaller extent) NMR. The background of the students led to the need for a significant portion of the course to be focused on the basic principles behind the techniques, and the chemistry behind physicochemical properties, including lipophilicity, molecular mass, and nuclear spin. All were alien concepts to many of the students, so required the teaching of fundamentals generally not required for PharmD students. Feedback from students was positive, showing the level was appropriate. Conclusions: The development of online professional chemical science MS courses requires the collaboration of employers (outcomes) and diverse faculty (knowledge base), while considering the background of the students is very different to those in the professional program.

Differentiation of Medical Cannabis Drug Products Using Chemotype Analysis

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Objective: Medical cannabis drug products are currently differentiated by genetics (“strain”) of the plant. This study sought to determine if cannabinoids and terpenes (“chemotypes”) can predict pharmacologic effects more accurately than the strain, providing an improved classification system. Methods: Four years of chemotype data was collected from state-required certificates of analysis for all products sold at a medical cannabis dispensary in Connecticut. The data was compiled into a Microsoft Excel spreadsheet, then analyzed by Weka machine learning technology. PCA was initially used to determine key chemical constituents. Subsequently, three machine learning algorithms (J48, SMO, and MLP) were used to analyze various Cannabis product descriptors. They were trained on the first six months of data. Cross-validation was used to analyze the remaining 30 months of data. Descriptors included but were not limited to: Method, Type, Subtype, Strain, and Month. Results: From September 2016 to January 2021, 5,384 data points were analyzed and presented as a ratio of true positive (TP); False positive (FP). This provided a percentage of correct to incorrect prediction and recall using the three algorithms. Through cross-validation, the J48 machine learning approach correctly predicted Method, Type, and Subtype with a recall of 90.2%, 90.0%, and 76.4%, respectively. Strain and Month (negative control) were both poorly predicted with a recall of 51.8% and 13.4%, respectively. Conclusions: The results indicate that discrimination of cannabis drug products by type and subtype were more accurate predictors of pharmacologic effects than by strain.

Effects of Didactic Term Length on Student Performance in a Medicinal Chemistry and Pharmacology Course

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Objective: The objective of this study was to determine the effects of changing the didactic term length from a five-week quarter-based curriculum to a seven-week block-based curriculum on student exam performance in a Medicinal Chemistry and Pharmacology course. Methods: Student exam performance was analyzed for an average of 71 students per year from the 2015/16 academic year to the 2019/20 academic year. Exam averages and percent failure rates (less than 70% score on an exam) were determined within 95% confidence intervals. Results: It was found that student exam performance was significantly affected with lower mean scores and higher failure rates upon the change from a 5-week didactic term length before examination to a 7-week didactic term length, an increase of 40% in the amount of material covered in an exam. The average exam score decreased from 82.4% from the 2015/16 to 2017/18 academic years with the 5-week didactic term, to 79.2% with the change to a 7-week block in 2018/19 (p=.050). Additionally, the failure rates increased from an average of 11% for the 2015/16 to 2017/18 academic years, to 21% in 2018/19 (p=.105). It was observed in 2019/2020 that a significant increase in the number of quizzes (with attendant quiz drops) resulted in improved test score averages and lowered failure rates. Conclusions: Increasing the didactic term length with an attendant increase in the amount of material to be tested in exams, without changing other variables in a Medicinal Chemistry and Pharmacology course, results in decreased exam scores and significantly increased failure rates. Increasing quiz frequency in the longer didactic term had a beneficial effect on exam performance.
Evaluation of Auxin-mimetic Phytotoxic Effects of NSAIDs as an Alternative Assay Model

Christopher Garzia, MCPHS University–Worcester/Manchester, Tyler Holmes, MCPHS University–Worcester/Manchester, Matthew Metcalf, MCPHS University–Worcester/Manchester.

Objective: This work describes the development of a viable plant-based alternative to the acetic acid antitussing mouse assay. The hypothesis was that nonsteroidal anti-inflammatory drugs would produce results similar to auxins in a plant assay of auxin activity. Methods: Pisum sativum seeds were germinated, then planted in Sphagnum moss saturated with half-strength shive solution in temperature, light, and humidity controlled environment. Sprout roots and shoots were measured 12 hours post incubation, then transferred to test medium in 10 mL scintillation vials of serially diluted NSAID compounds. Final measurements of growth inhibition and pH were taken 72 hours post-incubation. Results were analyzed statistically using a one-way ANOVA and dose response curves were plotted as a function of percent growth. Results: Effects were similar to auxin plant hormones, indole-3-butyric acid and 2-naphthylacetic acid, but significantly different in gibberellin acid, and acetaminophen. For root growth, IBA had an LD50 of 1.7 µM (p <.0001) and 2NA had an LD50 of 2.1 µM (p <.0001). In NSAIDs for root growth, naproxen had an LD50 of 23.1 µM (p <.0001), diclofenac had an LD50 of 36.5 µM (p <.0001), indomethacin had an LD50 of 32.77 µM (p <.0001), and acetylsalicylic acid had an LD50 of 7.8 µM. Indole acetic acid, 2-naphthylacetic acid, and the NSAIDs inhibited shoot growth (p <.0001); GA3 enhanced growth (p = .0002); and APAP had no effect on growth (p >.90). Conclusions: NSAIDs revealed phytotoxicological effects on root growth in a dose dependent manner in which nonsteroidal anti-inflammatory drugs produce auxin-memetic phytotoxic effects dissimilar to GA3 and APAP. They suggest that Pismum sativum is a suitable choice for further development of a plant-based drug assay with significantly reduced cost when compared to a mouse assay.

Pose Filter-Based Machine Learning Tools to Enhance Structure-Based Drug Discovery for G Protein-Coupled Receptors

Samichhya Paudel, Howard University, Simon Wang, Howard University.

Objective: Structure-based drug design (SBDD) technique has been extensively used at the early stage of the drug discovery. It results in cost reduce and time savings but the accuracy of scoring functions for protein-ligand interactions remain to be improved. To address it, we designed a pose filter-based ensemble (PFE) machine learning method to enhance the screening competence of SBDD scoring functions. We demonstrated the effectiveness of PFE tools coupled with traditional SBDD thus can provides promising active compounds for a target of interest for further development (doi:10.1021/acs.jcim.6b00749). Recently, this innovative technique was employed in the discovery of orally active, nonsteroidal Farnesoid X receptor (FXR) agonists (doi:10.1021/acs.jcim.9b01030). Built upon our prior success, we are now constructing the data sets for PFE in G protein-coupled receptors (GPCRs), one of the most pursued drug target families. Methods: We designed a novel workflow schematic of the algorithm used in this study. For improving ligand enrichment from diverse protein-ligand interfaces, PFE is coupled to the scoring function(s) in SBDD. Results: The results show that our PFE technique coupled with SBDD improve the performance of current scoring functions. So far, 62 GPCRs with different crystal structures and their ligands have been collected and manually curated. Three sets of 5HT2A, CRN1 and AA2AR receptors were generated with decoys using MUBD-DecoyMaker 2.0. ROC curves and physicochemical properties distributions of ligands and decoys demonstrate the premium quality of our data sets. Conclusions: We are conducting extensive benchmarking studies to all 62 GPCRs targets to validate that our PFEs coupled with scoring functions improve the early enrichment of SBDD. The PFEs can be applied to a multitude of diverse drug targets thus highly applicable to modern drug discovery.

Synthesis and Preclinical Studies of Fluorinated Anticonvulsant Analogs

Patrice L. Jackson-Ayotunde, University of Maryland Eastern Shore, Isis Amaye, University of Maryland Eastern Shore, Miguel Martin, University of Maryland Eastern Shore, Jamiya Kirkland, Howard University, Yayin Fang, Howard University.

Objective: From our fluorinated benzamide drug library, the lead enaminone THA40, was shown to be effective in the drug resistance epilepsy (DRE) 6Hz 44mA rodent seizure model with minimal neurotoxicity and sodium channel inhibition. The primary objective of this research was to conduct lead optimization studies on THA 40 to determine the chemical components that would improve overall efficacy and safety in acute generalized and DRE rodent models. Methods: A series of 15 novel fluorinated benzamide enamiones were synthesized in our lab using an established reaction protocol to achieve products of quantifiable yield and of high purity. All synthesized compounds were confirmed and characterized using 1HNMR, GCMS and elemental analysis methods. Animal studies were done in...
collaboration with the NINDS – Epilepsy Therapy Screening Program. Target identification studies were conducted in silico and in vitro. **Results:** Five out of the 15 analogs tested in vivo were shown to protect 75-100% of animals in the maximal electroshock and 6 Hz 44mA model at different doses and time intervals. The in vitro electrophysiology studies using ND7-23 cells, showed anticonvulsant analogs with a para trifluoromethyl (CF3) or trifluoromethoxy substitution to have an affinity for blocking the sodium channel. Conversely, bis-CF3 analog (IAA65) blocked the calcium T-type channels with almost 100% inhibition. Docking studies showed the new anticonvulsants interacted with the sodium channel by forming three important hydrogen bonds between the analogs and two important amino residues in the open form crystal structure, Lys166 and Tyr169. **Conclusions:** We conclude from both in silico and in vitro data that the drug target for some of our mono and di-substituted fluorinated enaminone anticonvulsant analogs is the epileptic related molecular targets sodium and calcium channels.

**US FDA-Approved Antibiotics During the 21st Century**

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**Objective:** To review all the US FDA approved antibiotics from 2000 to 2020 and analyze their medicinal chemistry properties and clinical applications. **Methods:** A thorough literature search was conducted using an array of scientific journal articles and online databases. **Results:** Thirty-five antibiotics have been approved by US FDA in the last 20 years. These antibiotics include new chemotype antibacterial classes such as oxazolidinone (linezolid and tedizolid phosphate), lipocyclopeptide (daftomycin), the cephalosporin-siderophore conjugate antibiotic (cefdiderocol), anti-difficile macrolide (fidaxomicin), and antibiotic resistance agents diarylquinoline and nitroimidazooxazime (bedaquiline and PA-824, respectively). The remaining advanced antibiotics based on existing antibacterial chemical classes include carbapenems (ertapenem and doripenem), nitroimidazoles (tinidazole and secnidazole), fluoroquinolones (gemifloxacin mesylate, besifloxacin, delafoxacin, and finafloxacin), ketolide (telithromycin), rifampin class (rifaximin), tetracycline and/or glycyclcline (tigecycline, eravacycline, omadacycline, and sarecycline), pleuromutilins (retapamulin and lefamulin), lipoglycopeptides (telavancin, oritavancin, and dalbavancin), cephalosporin (ceftaroline fosamil), aminoglycoside (plazomicin), four β-lactamase/β-lactam inhibitor combinations (ceftolozane/tazobactam, ceftazidime/avibactam, meropenem/vaborbactam, and imipenem/cilastatin/relebactam with a renal dehydropeptidase inhibitor), along with three monoclonal antibodies (mAbs) (raxibacumab, obiltoxaximab, and bezlotoxumab). Among these approved agents, four antibiotics (gemifloxacin mesylate, telithromycin, doripenem, and finafloxacin) have been either discontinued or pulled from the US market. The chemical class, physiochemical property, mode of action, route of administration and dosing frequency, pharmacokinetic profiles of each antibiotic will be discussed in detail. **Conclusions:** There is an urgent need to develop new antibiotics for the treatment of drug resistant bacterial infections. It is very important for researchers, student pharmacists, and clinicians to know about the newly approved antibiotics, be informed about their approved indications and appropriate uses, and understand their unique attributes that make them effective for the treatment of drug-resistant bacterial infections.

**CONTINUING PROFESSIONAL DEVELOPMENT**

**Assessing the Implementation of a Continuing Professional Development Advanced Pharmacy Practice Experience**

Kelsey Frederick, The University of Tennessee Health Science Center College of Pharmacy, Dawn Havrda, The University of Tennessee, James Wheeler, The University of Tennessee, Lauren Bivacca, The University of Tennessee, Catherine Crill, The University of Tennessee, Kenneth Hohmeier, The University of Tennessee.

**Objective:** Examine the implementation process of a new CPD APPE aimed to prepare students for a career of lifelong learning **Methods:** A novel 4-week, remote CPD APPE elective was developed and implemented in which students worked through each step of the CPD cycle and logged activities that facilitated achievement of self-identified learning objectives. At the end of the rotation, students submitted a final CPD portfolio and written reflection describing their experience with CPD. Data were collected using in-depth, key informant semi-structured interviews and an electronic, web-based survey. Survey participation was required of all students enrolled in the APPE for curricular assessment purposes. Early implementation outcomes measured include feasibility, appropriateness, and acceptability. Following rotation completion, interviews were conducted to a point of saturation. The interview guide was based on the Consolidated Framework for Implementation Research (CFIR). Interview candidates were identified via purposive sampling based on criteria believed to affect implementation
Assessment of First-Year Doctor of Pharmacy Students’ Professional Development

Katherine S. Wadas-Thalken, Creighton University, Ann Ryan Haddad, Creighton University, Kelli Coover, Creighton University, Kevin T. Fuji, Creighton University.

Objective: To assess the self-described professional growth of first-year Doctor of Pharmacy (Pharm.D.) students after introducing a Professional Development and Experience course series in the first year of their program.

Methods: Students completed an end-of-semester assignment for the Professional Development and Experience course series in which they reflected on how their coursework, IPPEs, and co-curricular activities contributed to their professional growth in five areas: self-awareness, leadership, innovation and entrepreneurship, and professionalism. A mixed methods approach was used to first code all student reflections by semester, followed by quantification and statistical analysis of codes. A qualitative codebook was established, focusing on the five major areas of professional growth addressed in the course. The researchers coded all student assignments and addressed discrepancies to reach consensus on whether each individual student met each area of professional growth. The proportion of students meeting each area of professional growth was then compared across the fall and spring semesters using a chi-square test with a significance level of $p<.05$.

Results: A total of 140 students completed assignments in the fall and 137 in the spring. While only innovation and entrepreneurship demonstrated a statistically significant increase (2.9% to 16.2%, $p<.001$), increases were seen across semesters for education and advocacy (0% to 21.9%), self-awareness (89.3% to 94.2%, $p=.141$), and leadership (50.7% to 59.9%, $p=.126$). The proportion of students demonstrating professionalism remained high (99.3% to 98.5%, $p=.549$).

Conclusions: A Professional Development and Experience course series introduced in the first year of a Pharm.D. program helped students to reflect on how curricular, co-curricular, and extracurricular activities were contributing to the ongoing development of their professional identity, and identify areas of improvement for future growth.

Confidence and Educational Needs of Missouri Pharmacists for Implementing COVID-19 and Childhood Vaccination Practices

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Objective: The purpose of this study was to assess pharmacist confidence in changing vaccination practices to incorporate both COVID-19 vaccines and pediatric vaccines and to assess educational needs for pharmacists.

Methods: An anonymous survey was distributed to practicing pharmacists in Missouri via Qualtrics. The survey was promoted by the Missouri Pharmacy Association, by faculty at the University of Missouri-Kansas City School of Pharmacy, and by the local Community Pharmacy Enhanced Services Network. The survey collected practice-site information, pharmacist current role in vaccination practices, four-point Likert-type confidence assessments, and pharmacist educational preferences. Confidence was assessed for four vaccination groups: routine adult, COVID-19, pediatric (age 7-17), and pediatric (age 3-6), and for three settings: on-site clinics, off-site clinics, and within practice-site workflow. A needs assessment was conducted for 18 educational topics related to COVID-19 vaccination practices and 4 topics covering pediatric vaccination practices.

Results: Twenty-five survey responses were received. The highest confidence was in providing COVID-19 vaccines and routine adult vaccines on-site (average 3.53 for both). The lowest confidence was in providing pediatric vaccinations for children ages 3-6 years in any setting (average 1.65 for all). The average number of education topics requested for COVID-19 vaccines and pediatric vaccines was 2.3 and 1.6, respectively. The most requested education topic for COVID-19 vaccines was billing for administration, and the most requested topic for pediatric vaccines was administration techniques. The majority of respondents preferred an education length of 10-15 minutes (85%).
Conclusions: Surveyed pharmacists are more confident in providing adult vaccinations than pediatric. Educational efforts focused on pediatric vaccination practices may be more impactful. Brief educational interventions may be a preferred mechanism for providing education to practicing pharmacists.

Emergency Preparedness Point-of-Dispensing (POD) Exercise: Interprofessional Faculty Collaboration and Students’ Training over Seven Years

Hoai-an Truong, University of Maryland Eastern Shore, Lana Sherr, University of Maryland Eastern Shore, Barbara Logan, Somerset County Health Department.

Objective: The Interprofessional Education Collaborative (IPEC) core competencies include communication, values/ethics, teamwork and roles and responsibilities. This abstract describes the incorporation of subdomains of IPEC competencies in developing, implementing and evaluating an emergency preparedness point-of-dispensing (POD) drill/exercise and the collaboration among inter-institutional and interprofessional faculty and students in collaboration with state and local health departments over 7 years. Methods: The POD drill was developed and implemented during the first couple years by faculty at University of Maryland Eastern Shore (UMES) School of Pharmacy and Health Professions in collaboration with the Maryland Department of Health Office of Preparedness and Response, the Maryland Board of Pharmacy Emergency Preparedness Taskforce, and Somerset County Health Department, then expanded to include those at Salisbury University also. Results: The interprofessional POD drill was conducted seven times during 2013-2019 and involved faculty from dietetics, kinesiology, nursing, pharmacy, physician assistant, physical therapy and respiratory therapy to provide simulated emergency preparedness training for over 850 students outside of the classroom. During the POD exercise, interprofessional students rotated through simulated activities at five stations: registration, triage, dispensing, special needs, and consultation. All planners, facilitators and participants provided feedback and evaluation through survey and post-action reports. The POD drill facilitated opportunity for students to sign up as volunteers for the Maryland Response for potential state emergency. Conclusions: This POD drill provided a collaborative opportunity for interdisciplinary faculty and dynamic educational setting for students to learn about, from and with each other in ensuring the safety and healthcare, including mass dispensing of medications for a local community in the event of a real large-scale emergency. Additional benefits included partnership with state and local health departments for real-world application of classroom lessons.

Engaging Students in Ownership of Professional Development in the Co-Curriculum: There’s an App for That!

Kristine S. Schonder, University of Pittsburgh, Karen S. Pater, University of Pittsburgh, Thomas Waters, University of Pittsburgh School of Pharmacy.

Objective: We developed an innovative web app that offers an affordable option to capture quantitative evidence of individual student experiences and skills developed through the co-curriculum. Methods: The web app allows students to track activities for seven co-curriculum skills, regardless of where learning occurs. On-demand reporting provides quantitative evidence of co-curriculum experiences to showcase professional development. The web app also interfaces with the e-Portfolio, which provides qualitative evidence, and together, the two complete the professional development profile. Results: The web app was developed using FileMaker technology and was launched in fall 2019 in a phased-in approach. Over the first three semesters of use in 2 professional years, students logged over 2200 co-curriculum activities. Individual student activities ranged from 1 to 25 activities in a single semester. Students generate individual reports each semester to include in the e-Portfolio and present the data from the web app during Professional Development Reviews in fall and spring semesters. Faculty advisors use data to develop individualized professional development plans for each student. Aggregate data provides insight on overall student achievement of co-curriculum goals, with students logging an average of 12 activities per skill (range 5-19). Administrative reports identify students not meeting professional development and co-curriculum goals to allow for early intervention to assure each student meets their goal prior to graduation. Conclusions: This affordable technology quantifies co-curriculum activities that shape individual student development and provides useful data for students, faculty, and administration to demonstrate how students are meeting ACPE Standards for co-curriculum goals and create individualized professional development plans for students.

Outcomes of a “Virtual Think Tank” to Establish Collaborative Leadership Initiative Plans (“CLIPs”)

Whitney D. Maxwell, University of South Carolina, Kerry K. Fierke, University of Minnesota, Gregory M. Zumach, Oregon State University.

Objective: To evaluate the outcomes of a “Virtual Think Tank” (VTT) for pharmacy educators that was recently provided by the Leadership Development Special Interest Group (LD SIG). Methods: Small groups of approximately10 individuals explored self-identified leadership
development (LD) interest areas and created Collaborative Leadership Initiative Plans (CLIPS) to implement. LD interest areas included Curriculum, Co-Curriculum, Faculty Development, Entrepreneurship/Innovation, Experiential Education, and Assessment. Attendees received a follow-up survey 6 months post-VTT including some reflective pre-/post-questions. Results: 39 of the 71 VTT attendees, representing 55 unique institutions, completed the survey (response rate = 55%). Following the VTT there was a significant increase in considering the LD SIG helpful for networking, leadership-related scholarship, teaching, and service as well as likelihood to collaborate with LD SIG members (p < .05 for all endpoints). Attendees also reported increased familiarity (p = .006) and willingness (p = .0024) to utilize LD SIG resources. Important qualitative outcomes included attendees continuing communications with CLIP groups post-VTT (20%) and 15.4% of respondents indicating successful implementation of CLIP ideas post-VTT. Programmatic examples of CLIP implementation included new national and global webinars on LD. Scholarly outcome examples included development of a new LD Award/Rubric for the LD SIG, and submission of an AACP SOTL grant application. One-third of respondents indicated the VTT inspired other novel leadership initiatives, including a virtual coffee hour, new scholarly collaborations, and greater LD SIG involvement. Conclusions: A virtual “Think Tank” led to development and implementation of CLIP ideas post-VTT. Programmatic examples of CLIP implementation included new national and global webinars on LD. Scholarly outcome examples included development of a new LD Award/Rubric for the LD SIG, and submission of an AACP SOTL grant application. One-third of respondents indicated the VTT inspired other novel leadership initiatives, including a virtual coffee hour, new scholarly collaborations, and greater LD SIG involvement. Preparing Faculty and Preceptors to Create an Inclusive Learning Environment
Morbitzer Kathryn, University of North Carolina at Chapel Hill, Jacqueline McLaughlin, University of North Carolina at Chapel Hill, Carla Y. White, University of North Carolina at Chapel Hill.

Objective: Equity, diversity, and inclusion is a priority for pharmacy education. A diverse and culturally responsive workforce is needed to close the gap on health disparities and provide equitable healthcare. Faculty and preceptor development is a critical step in this process. The objective of this study was to describe the design, implementation, and initial impact of an inclusive learning faculty and preceptor development series. Methods: Three faculty development programs on inclusive teaching practices were offered synchronously online in Fall 2020. Programs were tailored for faculty teaching in the professional program, graduate program, and experiential rotations. Each program was one hour and included discussions on terminology and strategies for content development and decorum. Scenarios based on real examples were created for small group discussion. Each program was recorded and accessible on a school website. At the conclusion of the program, participants were asked to complete an anonymous program evaluation. Results: Attendance for the three programs totaled 166 participants. Seventy-seven participants completed the program evaluation (46% response rate). The average rating for overall value of “what I learned” and “overall quality of the program” were both 4.5 out of 5.0. Participants expressed an appreciation for the quality of the program facilitators/presenters, real-world case studies, and program formats. Participants indicated a desire for more time and opportunities to discuss inclusive learning strategies. Conclusions: School-designed faculty development programs are an effective way to equip faculty and preceptors with strategies that contribute to creating an inclusive learning environment for all students.

EXPERIENTIAL EDUCATION
"What's up DOCC?" Transitioning to a Virtual IPE Collaboration between Learners and Families
Gina M. Baugh, West Virginia University.

Objective: Understand the advantages of implementing the national Project Delivery of Chronic Care (DOCC) curriculum as a virtual interprofessional education session. Methods: Project DOCC, originally developed as an activity for medical residents, was adopted as an interprofessional activity in 2019 for 3 disciplines (medicine, nursing, and pharmacy). Learners participated in person to interview parents of children with chronic disabilities and learn about their healthcare experience. Pharmacy students participated on a voluntary basis for community service hours. In March 2020, the in-person session was transitioned to a virtual environment due to COVID-19, and learners have expanded to include occupational therapy, physician assistant, public health, and social work. Results: From March 2019 to March 2020, five sessions were held in person for 72 students from the main campus. That included 16 third- and fourth-year student pharmacists participating for community service credit. That number increased to 200 students from three campuses participating from April 2020 to February 2021 for the virtual sessions. Seventy-seven third year pharmacy students participated as a requirement of their IPPE Ambulatory Care Experience course. The number of parents increased from three to six or more. More parents were available due to the decreased demand of their time due to eliminating travel and the need for childcare. Resource needs have decreased, including space for interviews and costs for reimbursement for parent travel. Conclusions: The adapted virtual Project DOCC curriculum is an effective strategy to educate interprofessional teams of future healthcare professionals about the role of the patient.
and family in the provision of patient-centered care. The virtual model has several advantages including increasing the number of participating learners and decreasing resource needs.

**A National Overview of IPPE Program Development, Trends and Challenges from 2008 to Present**

Patricia L. Darbishire, Purdue University, Trish S. Devine, Butler University, Allyson C. Prichard, Purdue University.

**Objective:** The research question is: How have IPPE programs transformed from conception to present time? The objective of the research is to explore national trends and challenges in IPPE program development, structure, administration, and quality assurance initiatives over time. **Methods:** In 2008, 2013 and again in 2020, a web-based survey was sent to IPPE program administrators at fully accredited and candidate status colleges and schools of pharmacy. The surveys addressed a variety of administrative aspects and challenges within IPPE programs, including personnel, program structure, student onboarding, preceptor orientation and development, and quality assurance initiatives. This research compares and contrasts the results over time to examine trends and persistent challenges within experiential education, focusing on IPPEs. The researchers include a call to action and pose solutions for areas of concern.

**Results:** In 2008, 50.5% of IPPE administrators from pharmacy schools across the nation responded to the request for data; 64.5% responded in 2013, and 80.1% in 2020 - indicating a growing interest in sharing of ideas and potential solutions to ongoing challenges. All primary US geographic areas were represented in each of the three surveys. Average class size trended down (from 125 to 113). Multiple changes in resources allocation were noted over time, including the number of faculty holding IPPE administrator positions (opposed to staff) and resource shifts based on separation of IPPE and APPE programs. Significant changes were noted over time in program structure, student onboarding requirements, and quality assurance initiatives, whereas many challenges remain, including program assessment, institutional setting placements, preceptor training, and program staffing. **Conclusions:** These results can be used as a stimulus to examine and address ongoing issues and enhance the quality of IPPE programs.

**A Qualitative Analysis of Student Interprofessional Education and Practice Experiences during Advanced Pharmacy Practice Experiences**

Zachary A. Weber, Purdue University, Kate Caward, Purdue University.

**Objective:** Interprofessional collaboration is the best practice for patient care and the need to have interprofessional education (IPE) is a priority in training healthcare providers. The Purdue University College of Pharmacy adopted a longitudinal IPE curriculum in 2017, which culminates with IPE opportunities during APPEs. The purpose of this study is to describe a qualitative assessment of IPE experiences and collaboration during APPEs. **Methods:** On end-of-block APPE evaluations, students provide a qualitative description of the type of IPE opportunities available during patient care rotations and with whom they had the opportunity to collaborate. A qualitative analysis of existing APPE evaluation data was completed to analyze the type of IPE experiences and collaboration PharmD students had during APPEs. **Results:** Three major themes emerged describing IPE considerations during APPEs. Theme 1 was whether students felt like an active contributing member of the therapeutic decision-making process, theme 2 described the type of IPE that occurred while on their APPE, and theme 3 described the other healthcare team members involved. Overwhelmingly, students felt like an active contributing member of the therapeutic decision-making process. Results indicate that “Dosing/Recommendation/Suggestion/Care Plan/Chart Review” is the most prevalent experience while “Rounds” is secondary. “Physicians” and “Nurses” are the other professions with whom PharmD students interact the most. **Conclusions:** The findings of this research are important to describe the level and type of IPE during APPEs. This is important information for programs to gather as they evaluate required IPE experiences during both didactic and experiential education. This study also confirms students are getting many interprofessional experiences, and expressed pride and increased confidence in their abilities to be effective interprofessional team members.

**A Qualitative Assessment of the Impact of International APPE Rotations on Cultural Immersion**

Jamila Jorden, Howard University, Miranda Law, Howard University.

**Objective:** To qualitatively assess cultural immersion during an International Advanced Pharmacy Practice Experience (APPE). **Methods:** The Howard University College of Pharmacy (HUCOP) international program affords final year pharmacist students the opportunity to travel overseas for a five-week APPE. Students complete an experience at one of 15 different practice sites located in 13 different countries, across four continents. The goal of the program is not only to expose students to different pharmacy practices but ensure they develop skills necessary to be culturally
Auburn University

Objective: To develop a novel spatiotemporal analytical framework that schools of pharmacy can implement to assess community diversity at site placement for experiential programs. Methods: We conducted a repeated cross-sectional spatial analysis of PharmD student placements in community practicum experiences in Florida from 2016 to 2020, by academic year and practicum type (introductory and advanced). Student-level data were aggregated to create individual site-level files by academic year. Site-level data were then aggregated by census-tract data based on geocoded location. Site-level community data were derived from the US Census American Community Survey for 2015. We examined the distribution of placed students across socioeconomic characteristics (percent Black and percent Hispanic residents) of each respective site’s census tract. Distribution of site placements were compared against overall state mean percentage of Black and Hispanic residents.

Results: There were 223 unique community practice sites across all academic years. Placements in introductory practicum sites with a proportion of Black residents greater than the Florida mean ranged from 26.7% (2016/17) to 35.3% (2019/20) of students in the academic year, advanced practicum sites ranged from 24.8% (2018/19) to 30.6% (2019/20). Placements in introductory sites with proportion of Hispanic residents greater than the Florida mean ranged from 23.7% (2016/17) to 29.9% (2017/18) of students in the academic year, advanced practicum sites ranged from 11.2% (2017/18) to 17.3% (2019/20).

Conclusions: Ensuring exposure to diverse patient populations is important to enhance students’ patient care skills. All sites in all academic years were under-represented in terms of proportion of Black and Hispanic residents in the respective communities as compared with Florida mean. The analytic framework we developed will be used to monitor future experiential placements over time moving forward.

Are you Ready to Rotate? A Required APPE Orientation Course

Lynn Stevenson, Auburn University, Kaitlin Alexander, Auburn University, Miranda Andrus, Auburn University, April Staton, Auburn University, Adelia Grabowsky, Auburn University, Lea S. Eiland, Auburn University Harrison School of Pharmacy.

Objective: To describe the implementation and impact of a new, required "Pre-APPE Workshop" course. The course goal is to prepare students for APPEs in a concentrated one-week experience that provides real-world application in five areas: professional development, behavior, and communication, the patient workflow process, and application of drug information. Methods: The course was developed using backward design methodology based on our school's practice-ready competencies and was first offered in Spring 2020 via live, synchronous, remote teaching. Individual and group activities focused on orienting students to the ACPE expectations for APPEs, such as direct patient care and interprofessional interactions. Assignments and activities were designed to mimic upcoming APPE rotation requirements. Students completed a required 34-item self-assessment of their comfort level with APPE activities and expectations immediately before and after the course. A voluntary follow-up survey was provided nine months into APPEs to determine the extended impact of course content and learning activities in preparing students for APPEs.

Results: Post-assessment scores statistically improved compared to pre-assessment scores on all 34 domains assessed (100% response rates). Evaluating a formal patient presentation, preparing an in-service assignment,
Assessing Student Critical Thinking Skills Utilizing Choose Your Own Adventure Patient Case Activities

Sara Revolinski, Medical College of Wisconsin; Ciara Beckers, Medical College of Wisconsin; Rachel S. Kavanaugh, Medical College of Wisconsin.

Objective: To assess student critical thinking skills during a choose your own adventure patient case activity to gauge advanced pharmacy practice experience (APPE) readiness. Methods: In Spring 2019, the Office of Experiential Education at the Medical College of Wisconsin (MCW) School of Pharmacy developed electronic choose your own adventure (CYOA) patient cases where students determine pharmacotherapy plans and justify rationale for those plans. Students complete a total of four CYOA cases across the first two didactic years of an expedited three-year curriculum. Student pharmacotherapy decisions and clinical rationale is assessed using a Critical Thinking Rubric. The rubric contains four distinct criteria: rationale, supporting evidence, exclusive reason, and organization of response. Each criteria is assessed via the following scale: 2 points if the response meets competency, 1 point if the response needs improvement, and 0 points if the response is unsatisfactory. As students progress through the program, they must achieve increasing scores to pass the activity. Students who do not pass the assignment are required to remediate the activity as per the school’s competency-based curriculum. Results: For the graduating class of 2020, two CYOA activities were completed. No students required remediation for the first activity, while 30% of students remediated the second. For the graduating class of 2021, four CYOA activities were completed. Remediation lessened over time, with 74.5% of students remediating activity 1, 23.5% remediating activity 2, and no students remediating activities 3 and 4. For the graduating class of 2020, three activities have been completed to date, with 12.2% remediating activity 1 and no students remediating activities 2 and 3. Conclusions: Critical thinking skills improve as students progress through the didactic curriculum, suggesting students are APPE ready.

Assessing Validity of a Preceptor Performance Assessment Instrument

Teresa A. O’Sullivan, University of Washington, Jennifer Chang, University of Washington.

Objective: To determine preceptor performance assessment instrument validity using evidence from a variety of measures. Methods: In our preceptor performance instrument, students assess global performance of their preceptors separately from performance in 15 specific precepting behaviors. Knowing accuracy of student recall decreases over time, we measured the percent of students submitting their assessments within a month after completion of an advanced pharmacy practice experience (APPE). To determine usefulness of the scores to preceptors, we examined the percent of preceptors reading their student evaluations who were pleased with them. Internal structure was assessed using principal components analysis (PCA) to test construct validity and Cronbach’s alpha to test response reliability. Results: Over 90% of students submitted preceptor performance assessments within four weeks of completing their APPE, decreasing likelihood of error due to memory inaccuracy. Of preceptors who actively precepted in the prior year and reviewed their performance assessments, 92% in 2018 and 91% in 2019 reported being pleased with their assessments. The PCA identified two distinct groupings of behavior scores, one aligned with teaching, coaching, and facilitating behaviors and the other with role modeling behaviors, indicating students were successfully distinguishing between behaviors. The Cronbach’s alpha for the global and specific precepting performance was 0.85, a measure indicating good reliability. Conclusions: Most students assessed their preceptors soon after the experience, decreasing the likelihood of error due to inaccurate memory. The majority of preceptors who read their performance assessments were pleased with them. The preceptor performance assessment instrument showed a valid construct and good reliability. The instrument appears accurate, useful, valid and reliable. To our knowledge, this is the first report of a pharmacy preceptor performance assessment instrument validation.

Association Between Number of Clinical Patient-Facing Advanced Pharmacy Practice Experiences and PGY1 Residency Match Outcomes

Renu F. Singh, University of California, San Diego, Jennifer Namba, University of California, San Diego, Laura Hart,
Objective: Study objectives were to: 1) Characterize the association between number of clinical patient-facing (CPF) Advanced Pharmacy Practice Experiences (APPEs) and postgraduate year one (PGY1) residency match outcomes 2) Quantify the number of CPF-APPEs associated with an increased probability of matching. Methods: A retrospective cohort study was performed among PGY1 residency-seeking Doctor of Pharmacy students from one school of pharmacy. Students seeking a PGY1 residency from graduation years (GY) 2018-2020 were identified from a National Matching Services Inc. enrollee list. Exposure of interest was number of CPF-APPEs (defined as core or elective acute/ambulatory care experiences) completed before January of the respective GY. Outcome of interest was PGY1 residency matching. Classification and regression tree (CART) analyses were performed to identify the CPF-APPE threshold associated with an increased likelihood of matching. Results: Among 132 students meeting inclusion criteria, the median (interquartile range) number of CPF-APPEs completed prior to January was 3 (3-4). There were 89 (67.4%) students who matched in any phase. The probability of matching was 22.2%, 69.2%, and 73.3% in students completing 2, 3 or 4 CPF-APPEs, respectively (p = .01). CART identified ≥3 CPF-APPEs as the threshold where the probability of matching was significantly higher than those with <3 CPF-APPEs (70.2% vs 22.2%, p = .006). Conclusions: Higher numbers of CPF-APPEs and completing ≥3 CPF-APPEs before January of the respective GY were associated with an increased probability of PGY1 residency matching. These findings may influence students’ rankings for CPF-APPEs to improve match results, but may be limited by institutional capacity to meet student preferences.

Association of Student Performance in Didactic Courses With Advanced Pharmacy Practice Experience Performance


Objective: To evaluate the association between student performance in didactic courses with advanced pharmacy practice experience (APPE) performance. Methods: A retrospective review was performed on student data from the graduating classes of 2018-2020. Information included the mean exam score for each of 7 didactic courses and final scores across all APPEs. A poor performer was defined as a score less than 83% on the mean exam score within a didactic course or at least one APPE. Student’s T-tests were performed to determine if student exam performance in didactic courses were associated with APPE performance. A sensitivity analysis was conducted using Fisher’s exact test to confirm the association. Additionally, a sub-analysis was performed between the number of didactic courses a student performed poorly in compared to APPE poor performance. Results: There were 49 APPE poor performers out of 400 (12%). The number of poor performers in didactic courses varied from 25-217 (6-54%). Student performance in all 7 didactic courses was statistically significantly associated with poor performance in APPEs (p<.01). When assessing poor student performance in the sensitivity analysis, 5 out of 7 didactic courses (i.e. clinical pharmacokinetics, pharmacotherapy I, drug literature evaluation, nonprescription products and pharmacotherapy IV) were significantly associated with poor performance in APPEs (p<.05). In the sub-analysis, 65% of APPE poor performers scored below 83% in at least 3 didactic courses (p<.01). Conclusions: Performance in didactic courses is associated with APPE performance; poor performance in multiple didactic courses is associated with poor performance on APPEs. Further investigation is needed to better predict and prevent APPE poor performance.

COAST-IT to Combat Social Isolation: Connecting Older Adults with Students Through Interprofessional Telecare

Dana Hammer, University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences, Patricia Meyer, University of Colorado, Jodi Waterhouse, University of Colorado, Sarah Tietz, University of Colorado.

Objective: Create and implement an enriching service learning/co-curricular program safely and remotely for the 2020-2021 academic year. Methods: Authors created and implemented a pandemic-friendly program that temporarily replaced an in-person elementary-school program required for all first-year PharmD students. Development included 1) Connecting with inter-professional faculty and staff providing telehealth services via the UCHealth Seniors Clinic (UCHSC), 2) Modifying telehealth procedures so that novice students could engage safely and remotely with socially-isolated older adult partners (OAPs) via phone or video, 3)
Recruiting OAPs from UCHSC, skilled nursing facilities, assisted living, independent retirement communities, and those living independently, across Colorado and beyond, 4) Training pharmacy, nurse practitioner and dental medicine students to engage with individually assigned OAPs, adjusting for each school’s needs, 5) Planning and executing monthly zoom sessions with all students featuring guest speakers on geriatric topics, 6) Tracking bi-monthly pharmacy student call documentation, and 7) Adjusting partnerships as needed after monitoring students’ progress.

Results: Goals of resulting program were to 1) reduce social isolation of OAPs, 2) improve students’ conversational skills, and 3) increase students’ knowledge of and empathy toward challenges facing older adults. To date, 271 OAPs representing 35 facilities in 8 states, and 135 pharmacy, 36 nurse practitioner, and 49 dental medicine students, have participated in ~1857 phone/video conversations. Pharmacy student mid-year evaluations noted that 55% felt that the program helped them improve communication skills and learn more about older adult challenges. Anecdotally, many students and several OAPs (or their agents) have reported high levels of satisfaction with the program as well as reduced feelings of loneliness and isolation.

Conclusions: The COAST-IT program has been a beneficial and safe replacement for a previous in-person service-learning program.

Comparing Student Self-Reported Confidence with Interprofessional Education Collaborative Sub-Competencies After Introductory and Advanced Pharmacy Experiences

Gretchen Jehle, MCPHS University - Worcester/Manchester, Kaelen Duncan, MCPHS University Worcester/Manchester, Kara Bonaceto, MCPHS University - Worcester/Manchester, Karyn Sullivan, MCPHS University - Worcester/Manchester.

Objective: Identify changes in self-reported levels of confidence with regard to Interprofessional Education Collaborative (IPEC) sub-competencies as students progress from introductory to advanced pharmacy practice experiences.

Methods: Students complete one interprofessional education (IPE) field encounter submission during both institutional and community Introductory Pharmacy Practice Experiences (IPPEs) experiences and one IPE field encounter during each core Advanced Pharmacy Practice Experiences (APPEs). Documentation includes which health care professional(s) students collaborated with, responses to 10 questions related to confidence with IPEC sub-competency areas, and description of one interprofessional encounter. Aggregate IPE field encounters for IPPE versus APPE responses for the class of 2020 cohort on institutional and community experiences were compared for percent change in reported confidence levels for each sub-competency.

Results: Students completing community IPE field encounters were 227(83.5%) IPPE and 222 (81.6%) APPE; and those completing institutional field encounters were 249 (91.5%) IPPE and 221 (81.3%) APPE. Confidence improved when comparing IPPE to APPE; 10 of 10 sub-competencies for the community IPPE vs APPE, and 9 of 10 for the institutional comparison showed a positive change in confidence level (up to 20% improvement). Sub-competencies with the greatest change from IPPE to APPE responses included Teams and Teamwork (TT3): being able to engage other health care professionals in shared problem-solving (both community and institutional); and Interprofessional Communication (CC4): being able to encourage ideas and opinions from other team members (institutional).

Conclusions: Student completion of IPE field encounters on IPPEs and APPEs is one method for documenting progression with IPEC sub-competencies.

Designing a Health and Wellness IPPE to Reinforce Student Pharmacist Skills and Enhance Patient Care

Lynn Stevenson, Auburn University, Lena McDowell, Auburn University Harrison School of Pharmacy, Robert Helmer, Auburn University, Alexandra Sierko, Auburn University Harrison School of Pharmacy, Kimberly Braxton-Lloyd, Auburn University.

Objective: To describe the development of a one-week intensive community pharmacy-based Health and Wellness Introductory Pharmacy Practice Experience (IPPE) focused on immunizations and health screenings.

Methods: The Health and Wellness IPPE is a 40-hour rotation that was developed to provide students with direct patient care opportunities to reinforce knowledge and skills learned in the didactic portion of the curriculum and to address ACPE accreditation standards. Rotation activities include administering immunizations, performing blood pressure and blood glucose screenings, and counseling patients. Students completed a pre- and post-IPPE self-assessment, rating their confidence in their abilities to perform these skills. The IPPE is strategically scheduled during the P2 fall semester after students complete the American Pharmacists Association’s Pharmacy-Based Immunization Delivery certificate training program and to assist preceptors and community pharmacy training sites during a period of high demand for immunizations, specifically influenza vaccines. Preceptors were surveyed regarding the feasibility and timing of the rotation.

Results: During the IPPE, 147 students administered 9,392 immunizations including 8,434 influenza immunizations and performed 3,458 patient health
assessments. Students’ self-reported average confidence in all areas increased after the IPPE. Most preceptors indicated the core rotation activities were feasible at their sites and the timing was appropriate, and all felt the IPPE rotation was a beneficial addition to the experiential curriculum. Conclusions: This model filled an unmet need in pharmacy student education regarding structured practice administering immunizations and performing health screenings beyond the classroom. The intensive one-week experience structure limited the on-going impact of the services but proved to be a valuable opportunity for students to provide clinical services and reinforce their knowledge and skills.

Development and Implementation of a Remote Community Pharmacy and Ambulatory Care Advanced Pharmacy Practice Experience

Rebecca R. Schoen, Duquesne University, Tiffany Hatcher, Duquesne University, Gale Garmon, Duquesne University, Autumn L. Stewart-Lynch, Duquesne University.

Objective: Statewide stay-at-home orders due to the 2019 coronavirus pandemic necessitated adaptation of Advanced Pharmacy Practice Experiences (APPEs) for student pharmacists displaced from rotation sites. This study describes the implementation of a remote required ambulatory care (RAM) and community pharmacy (RCP) dual-cohort APPE rotation from the student pharmacist perspective with potential insights for future traditional rotations. Methods: Community and ambulatory care clinical faculty members developed a rotation experience conducted primarily via synchronous sessions on Zoom for 45 students in the spring of 2020. The experience utilized a variety of elements encompassing patient cases and other activities to achieve Center for the Advancement of Pharmacy Education (CAPE) outcomes and provide a meaningful commensurate experience. Students were surveyed at the conclusion of the experience to gather demographic data, perceived effectiveness in meeting CAPE outcomes and value of the learning experience. Results: A total of 24 students completed the survey (53% response rate). Agreement was highest (95.7%) that the rotation improved the students’ abilities within the 1.1 (Learner), 2.2 (Manager), and 4.4 (Professional) subdomains. Students most frequently valued the diversity of patient cases and topic discussions. Simulations including a MyDispense Activity and Anticoag Games were the most highly ranked among the RCP and RAM specific activities respectively. Conclusions: The remote APPE allowed students to complete required rotations in the midst of a global pandemic. Students responded positively to the experience and indicated that a remote APPE rotation experience was meaningful and improved abilities on key CAPE outcomes, acknowledging the limitations of a remote environment. Expanded diversity of disease states facilitated by strong preceptor collaboration should be considered for integration into traditional rotations in the future.

Development of a Mentoring Program from an Experiential Education Lens

Andrea Murzello, Larkin University, Mark Garofoli, West Virginia University, Jennifer Steinberg, Nova Southeastern University, Tracy K. Pettinger, Idaho State University College of Pharmacy, Keith DelMonte, St. John Fisher College, Andrea Joseph, Thomas Jefferson University.

Objective: To describe the development, execution, and ongoing evaluation of a mentorship program for the AACP Experiential Education Section. Methods: In 2019, the AACP Experiential Education Membership Committee was charged with creating a mentorship program which was rolled out for the 2020-2021 academic year. The program was developed to match participants for a one-year commitment, with the hope that a natural ongoing mentoring relationship would persist beyond the structured time period. A call for interest was sent to section members in May 2020 and the AACP Experiential Education Membership Committee announced mentor-mentee pairs in July 2020. Mentoring pairs were created based on several criteria, including but not limited to tenure track, institution type, and IPPE or APPE focus. Evaluation of the program consists of a pre-survey, midpoint survey, and scheduled post survey of participants. Results: There were 84 mentor/mentee pairs for the initial mentorship year, 2020-2021. In the midpoint survey, it was found that the majority of the participants were satisfied with the mentorship program with all levels of satisfaction rated 5 and above on a 10-point scale. Recommendations for areas of improvement for future matches included: logistical recommendations as well as further guidance and reminders for mentorship meetings. Program success will be further evaluated with the post survey at the end of the initial mentorship year. Conclusions: Based on our initial findings, the mentorship program has been successful and over 75% of survey participants are interested in continuing in the mentorship program for the following year. As a result, the AACP Experiential Education Membership Committee will be continued annually and will use evaluations for quality assessment and improvement for future years.

Development of a Standardized Entrustable Professional Activities (EPA) Based APPE Evaluation Tool

Nicole S. Culhane, Notre Dame of Maryland University, Agnes Ann Feemster, University of Maryland School of Pharmacy.
Objective: A large academic health system approached their School of Pharmacy partners to encourage adoption of a standardized APPE evaluation tool based on feedback from preceptors that variation in grading processes created confusion and increased assessment time. Two Schools of Pharmacy within Baltimore collaborated to develop an evaluation tool and grading rubric with primary objectives of unifying the assessment of students within the state, improving efficiency of the evaluation process, and incorporating the EPAs. Methods: The Schools gathered information from a variety of sources to inform the initial evaluation development process. A draft evaluation was developed for review by the faculty at each school, and feedback was gathered. One school piloted the evaluation in the ambulatory care course and surveyed preceptor satisfaction. The other tested the evaluation with a select group of faculty. Based on the survey results and feedback from faculty at the individual schools, an evaluation tool was finalized. Results: Preceptors who piloted the evaluation (N=21) agreed that the evaluation enabled objective assessment of the student and provided specific feedback that the time to complete the evaluation was adequate. The piloted testers provided additional feedback that they were satisfied with the grading rubric and with incorporation of EPAs. Based on the pilot responses, a standardized EPA-based APPE evaluation was finalized. It includes evaluation of seven EPA domains using four levels of entrustment. Conclusions: Through collaboration, two schools developed a standardized, EPA based APPE evaluation that ensures a consistent student assessment strategy and streamlines the evaluation process.

Development of an Action-Based Evaluation Tool to Provide Preceptors Feedback from Student Pharmacists

Rachel Paulmann, Drake University, Viviana Cao, Drake University, Hanna Friedrich, Drake University, Cheryl L. Clarke, Drake University, Michelle M. Bottenberg, Drake University, Nora Stelter, Drake University.

Objective: To describe the development of an updated preceptor evaluation tool that provides preceptors with actionable feedback from APPE and IPPE student pharmacists. Methods: A literature review was conducted to identify best practices for action-based preceptor evaluations. Based on this review, potential evaluation statements were drafted. The College’s clinical faculty preceptors were surveyed to determine their perceived 1) utilization of current evaluations; 2) usefulness and actionability of 44 potential evaluation statements; and 3) desire to maintain any of the 24 current evaluation statements. Evaluation statements were drafted based on survey results. Potential scoring scales were also proposed. Five sequential review processes were conducted with the draft evaluation statements being refined after each review. Review processes included an Experiential Review Committee (ERC) meeting, expert panel on assessment, clinical faculty department meeting, clinical faculty email review, and a second ERC meeting. Results: Likert survey results indicated disagreement that current evaluations provided actionable information or that evaluations were used by preceptors to make changes. Based on survey results, 18 evaluation statements and 4 scoring scales were proposed for initial review. The number of evaluation statements edited by review process was ERC (n = 5), expert panel (n = 13), department meeting (n = 10), department email (n = 1), and second ERC (n = 0). Feedback themes included applicability to all settings and experiences, clear and consistent wording, focus on factors controlled by preceptors, and actionability. Likert-type scales were preferred over time-based scales. Conclusions: Survey results documented the need for a preceptor evaluation tool that provides actionable feedback. A revised preceptor evaluation tool focusing on the provision of actionable feedback to preceptors was successfully created through a multiple-step collaborative review process.

Development, Implementation, and Qualitative Outcomes of a Virtual Experiential Elective During a Pandemic

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Objective: To describe the development, implementation, and qualitative outcomes of a virtual Advanced Pharmacy Practice Experience (APPE) course to meet an urgent curricular gap during the coronavirus pandemic. Methods: Clinical faculty and pharmacy residents developed a six week, virtual APPE course that was launched between April-May 2020 to address the unanticipated loss of elective clinical rotations from partner sites. Course content focused on ambulatory care, acute care, geriatrics, immunization, and pharmacy law, and each weekly topic section was approximately 1-2 hours in length. Fourth year APPE students were assigned to develop content presentations, discuss advanced clinical cases, and apply pharmacy law topics. These assignments, and small group activities, were discussed virtually using the Zoom cloud platform. Students were evaluated with midpoint and final evaluations with a standardized rubric created by course faculty.
Grades were based on four criteria: attendance, participation, effort, and quality of assignments completed, which were graded as satisfactory, unsatisfactory, or not applicable. Students evaluated preceptors using a 5-point Likert scale in 10 domains based on school-specific standardized criteria. **Results:** Twenty students participated in the course and received a final grade of satisfactory. Two students received a grade of unsatisfactory for effort. Both students later remediated by completing ad hoc makeup assignments. Aggregated results of faculty evaluations were overwhelmingly favorable with the majority of students either strongly agreeing or agreeing on all areas of the standardized preceptor criteria. The mean Likert scores for each domain ranged from 4.59 to 4.66. **Conclusions:** This virtual APPE course established the feasibility and favorability of this learning format as an alternative to traditional on-site experiential learning during a pandemic.

**Entrustable Professional Activities (EPA's): Just Checking a Box?**

Shaun E. Gleason, University of Colorado Anschutz Medical Campus, Megan Thompson, University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences, Paul Reynolds, University of Colorado Anschutz Medical Campus.

**Objective:** The University of Colorado Skaggs School of Pharmacy introduced EPAs for mid-career, distance-based, global PharmD and MS students in 2019. NTPD students, who are US- or Canadian-licensed pharmacists, are offered greater EPA choice as part of their co-curricular, self-development requirement. This program evaluation describes the outcomes of this choice-driven offering as a first step in determining its appropriateness and value in this cohort. **Methods:** Students complete any 4 of the 65 EPAs offered, including AACP Core EPAs (n=49; 75%), and more advanced school-specific EPAs designed for mid-career students with greater skill levels and practice needs (n=16). EPAs chosen are categorized by AACP domain, and by “core” or “advanced” levels. They may be completed at any site, reported as an advanced pharmacy practice experience (APPE) or workplace setting. Students self-report their perceived entrustability levels and preceptors provide their entrustability score, confirming or rejecting the level reported. A confirmed score of 3 (reactively supervised by other) is required. Median EPA levels and interquartile ranges (IQR’s) are reported. **Results:** Ten students completed 32 EPAs between August 2019-Feb. 2021, in the following domains: Patient care provider (n=26), Interprofessional team member (n=1), Population-health promoter (n=2), Practice manager (n=3). Of these, 29 (90%) were core and 3 advanced levels. Six were performed on an APPE, 26 at work. Median overall student entrustability level = 5 (supervises others), IQR 4-5. Of these, 29 confirmed, 3 pending. **Conclusions:** When given a choice, post-baccalaureate, mid-career PharmD students mostly choose core-level EPAs, completed at their workplace, to meet applied self-development requirements. They perform them very well. Further evaluation can determine if these EPA choices represent true development needs, practice-setting limitations or convenience. From this, programmatic changes may be identified.

**Evaluating P4 Pharmacy Students’ Perceptions of Remote Advanced Pharmacy Practice Experiences during the COVID-19 Pandemic**

Katharine Russo, St. John's University, Carina Acosta, St. John's University, Kimberly Ng, St. John's University.

**Objective:** The objective is to assess fourth-year PharmD (P4) students’ perceptions of remote Advanced Pharmacy Practice Experiences (APPEs) during the COVID-19 pandemic. There is limited data on student perceptions of experiential education during a public health crisis. **Methods:** A survey was developed to quantitatively assess student satisfaction and interactions with patients, healthcare providers, and preceptors during remote APPEs. Institutional review board approval was granted, and informed consent was received from each participant. From December 1-December 31, 2020, the survey was distributed to P4 students through a variety of online methods including direct emailing, the ASHP Pharmacy Student Forum, and Class of 2021 Facebook groups for each respective college. **Results:** 144 survey responses were collected. On average, 3 rotations were completed remotely. More than half of participants had patient interactions (56.3%) and worked directly with other healthcare professionals (57.6%). Students reported phone calls as the primary method of communication with patients (43.1%). Communication between students and preceptors was a combination of emails, text messages, and video conferencing (25.7%) daily (76.4%). Many students enjoyed their remote APPE experience (47.9%). A majority understood the roles and responsibilities of their preceptor (64.6%), improved their critical thinking skills (63.9%), and completed rewarding assignments (53.5%). Overall, students felt that they did not receive the same experience virtually (77.1%) and prefer in-person rotations (74.3%). **Conclusions:** The insight gained from this survey may help clinical rotation coordinators and preceptors understand student preferences and identify potential areas of improvement to guide future decisions on the delivery mode of APPEs.
Evaluating Self-Selected Professional Development Utilizing LinkedIn Learning

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Objective: Lifelong learning is integral to pharmacy education. Schools need ways to integrate personal/professional development (PPD) and promote lifelong learning. With over 15,000 courses, LinkedIn Learning is a potential tool. This research seeks to evaluate whether it’s a useful tool for PPD and whether students will self-select courses to develop functional skills or to foster affective skills. The hypothesis is that when courses are categorized, the self-selected courses will develop areas required in a Doctor of Pharmacy (PharmD) program related to 2016 ACPE Standard 4.

Methods: A pilot of 20 students each completed two self-selected LinkedIn Learning courses. For qualitative evaluation, faculty utilized a What, So What, Now What rubric on student reflections to categorize student-identified achieved outcomes; each reflection was also mapped to 2016 ACPE Standards. Students were surveyed on their perceptions of this activity to determine whether LinkedIn Learning is a useful tool to promote PPD.

Results: Of the courses selected, 37.5% fostered Standard 4 key elements, 35% functional skills, and 27.5% Standard 3 key elements. Based on reflections, communication (20%) and self-awareness (20%) were the top 2 affective skills developed. 75% of students agreed the assignment was a quality activity that helps with PPD. 75% of students agreed they plan to use this tool in the future for other certifications and PPD.

Conclusions: LinkedIn Learning can be utilized to promote PPD. This tool can aid in both affective and functional skills. Advantages include that this tool can be available post-graduation. Disadvantages to this pilot include relying on students to identify outcomes only based on reflections. One enhancement can be to map LinkedIn Learning course objectives to see if they align to student-identified outcomes.

Evaluation of a Novel IPPE to Increase Student Confidence Before APPEs

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Objective: Preparing pharmacy students with practice skills necessary for Advanced Pharmacy Practice Experiences (APPEs) is essential. Responding to an internal survey indicating 85% of P3s did not feel prepared for APPEs, an Introductory Pharmacy Practice Experience (IPPE IV) was designed to provide 16-hours of case-based experiences with clinical faculty immediately preceding APPEs. The objective of this study was to assess the impact of IPPE IV on students’ confidence regarding APPE preparedness.

Methods: The IPPE IV occurred in April-May 2020. An explanatory mixed methods design was used with data collected from a survey of closed- and open-ended questions administered pre- and post-IPPE IV. Surveys assessed confidence and perceived ability using the Pharmacists’ Patient Care Process, case presentations, professionalism, communication, and electronic medical record (EMR) use. A Wilcoxon signed-rank test was used to examine quantitative differences, while a qualitative content analysis was used to identify themes from open-ended questions that helped explain quantitative findings.

Results: Students (n=122) were significantly more confident in their ability to: collect (p=.013) and analyze (p<.001) information to identify medication-related problems; prioritize health-related needs (p<.001); create an evidence-based (p<.001), cost-effective (p<.001), collaborative (p=.007) care plan with adequate follow-up/monitoring (p=.015). Students demonstrated greater confidence in their ability to work up (p=.006) and present cases (p=.005); demonstrate self-awareness (p=.041), effectively communicate with patients/caregivers (p=.016) and providers (p=.010); and use an EMR (p=.010). Qualitative themes supported quantitative findings as IPPE IV reinforced therapeutics knowledge, provided valuable practice in working up and presenting patient cases, and set expectations for APPEs.

Conclusions: An IPPE IV immediately preceding APPEs had a positive impact on students’ confidence in areas important for APPE success. Future research will examine if improvements in confidence impact APPE performance.

Evaluation of Factors Influencing Student Perceptions of Virtual Experiential Education in Advanced Pharmacy Practiced Experiences

Jennifer Prisco, MCPHS University–Boston, Tewodros Eguale, MCPHS University–Boston, Jennifer Goldman, MCPHS University–Boston, Nicole Carace, MCPHS University–Worcester/Manchester.

Objective: The current pandemic has led to integration of remote/virtual education within a Doctor of Pharmacy (PharmD) program. The study objective is to highlight key areas for remote delivery of Advanced Pharmacy Practice Experience (APPE) education that can influence student experiences of the rotation quality when comparing to in-person APPE education. The hypothesis is that most students would be of the opinion that remote/virtual rotation
Experiences are equal to most/all other rotations onsite and in-person. **Methods:** Students in the Class of 2020 were surveyed who had one remote APPE prior to graduation, while the remaining prior APPEs were in-person/onsite. Utilizing a 39-question survey, remote/virtual APPE students reported on their experiences related to APPE perceived quality, technology concerns, time zone differences, paid work experience, preceptor responsiveness, and more. Responses were cross tabulated using Chi-square test, t-test for proportions and odds ratios. **Results:** Of the 489 APPE students surveyed, most students (76.7%) responded; 16.6% were of the opinion that this remote/virtual APPE was better than most/all other rotations that were in-person/onsite, 67.6% perceived the APPE as equal, and 15.8% viewed the APPE as worse. The preceptor’s response to questions/concerns significantly impacted student perceptions of the virtual APPE quality experience ($p < .05$). Students who had technology concerns throughout this rotation had a more than two-fold increase in identifying the virtual experience as worse than most/all other rotations ($p = .01$) compared to students with no technology concerns. **Conclusions:** The hypothesis was correct, as the majority of students perceived the virtual/remote APPE rotation to be equal to most/all other rotations that were onsite. This data allowed the OEE to address issues that could help individual students in future remote rotations and improve upon preceptor development.

**Evaluation of Students’ Confidence and Competence of Over the Counter (OTC) Consult Skills**

Lisa J. Killam-Worrall, **University of North Texas Health Science Center**, Jennifer T. Fix, **University of North Texas Health Science Center**, Dipa S. Patel, **University of North Texas Health Science Center**, Frank Ssentamu, **University of North Texas Health Science Center**.

**Objective:** This research study evaluates the effectiveness of OTC curriculum enhancements towards strengthening the students’ application and development of consultation skills following the IPPE Community. **Methods:** Survey instruments were constructed using Qualtrics survey tools to obtain feedback from preceptors and pharmacy students. Surveys were emailed directly to each participant with a stated response date. Identified participants were those who completed the IPPE Community in 2019 and 2020. The study included analysis of related competencies from student and preceptor evaluations. **Results:** There were 118 completions of the student survey. Most students rated themselves as 80-100% in confidence (52.54%), competence (49.15%) and engagement (55.08%) in providing OTC consults after the IPPE Community rotation. Some students rated themselves as 60-79% in confidence (38.98%), competence (43.22%) and engagement (38.14%). Students selected class lectures, IPPE OTC Consults and OTC OSCE as most instrumental in providing OTC Consults during IPPE Community. Overall, students rated themselves as meet expectations in counseling patients (89.12%) and triaging for self-care (92.27%) on the IPPE Community Student Final Self-Evaluation. Preceptors rated our students as very confident/comfortable and confident/comfortable with providing OTC consults. The preceptors also rated the students favorably on gathering information, recommending appropriate OTC products, and providing education regarding OTC and non-pharmacologic options. Overall, preceptors rated students as meets expectations in counseling patients (91.75%) and triaging for self-care (90.21%) on the IPPE Community Preceptor Evaluation of Student. **Conclusions:** The student and the IPPE Community preceptor surveys and evaluations revealed that the majority of students are confident, competent and engaged in providing OTC consults following the IPPE Community rotation. Students rated the OTC curriculum enhancements as instrumental in their success to providing OTC consults.

**Exploring Factors That Influence Student Engagement in Community-Engaged Learning Activities Within a Pharmacy Context (ExCEL-Rx)**

Kayla Fang, **The University of British Columbia**, Gilly Lau, **The University of British Columbia**, Jamie Park, **The University of British Columbia**, Paulo Tchen, **The University of British Columbia**.

**Objective:** To investigate and identify factors that enhance and restrict student engagement in mandatory and voluntary community-engaged learning (CEL) activities. **Methods:** A phenomenological study utilizing semi-structured interviews was conducted with students participating in mandatory and voluntary CEL. Eligible participants were University of British Columbia students in the Entry-Practice Doctor of Pharmacy Program currently enrolled in or having previously taken a mandatory 20-hour CEL course in their second year. Fifteen students were randomly selected to participate in interviews exploring students’ motivations and barriers faced in their mandatory CEL course and any voluntary CEL activities (eg community outreach). Student responses were analyzed using qualitative thematic analysis. **Results:** Primary factors motivating student engagement in mandatory CEL included having structured learning activities for students and incorporating reflective learning. Motivating factors for students participating in voluntary CEL included personal interest in the topic, convenient location and time of activity, opportunity for career development, and advocating for the pharmacy profession. Overlapping motivations for both mandatory
and voluntary CEL included having a better understanding and broader perspective of the diverse populations in the community and imparting a positive impact. Common barriers identified included having limited information about student responsibilities, limited student role, and feeling unconfident or unprepared. **Conclusions:** Findings from this study suggest that both mandatory and voluntary CEL activities are crucial for the personal and professional development of pharmacy students. However, opportunities exist for identifying and managing barriers to further enhance student engagement in CEL within a pharmacy program and to further refine the use of learning tools, such as critical reflection, that were identified through this study to have contributed to student engagement with CEL.

**Exploring Preceptor Assessment of ACPE Standard 4: Leadership, Self-Awareness, Innovation and Entrepreneurship, and Professionalism**

Amy M. Pick, University of Nebraska Medical Center, Logan T. Murry, University of Iowa, Janice Murry, University of Nebraska Medical Center.

**Objective:** The objectives of this study were to 1) explore APPE/IPPE preceptor’s perspectives on ACPE Standard 4 educational outcomes, 2) identify student behaviors preceptors felt reflected outcomes acquisition, and 3) assess activities and experiences preceptors provided to facilitate the acquisition of Standard 4 outcomes. **Methods:** This was a cross-sectional study using electronic surveys distributed to all 451 APPE and IPPE preceptors associated with a single college of pharmacy. The survey consisted of 16 multiple choice and 11 open-ended items, with five items dedicated to preceptor demographics and 22 items dedicated to perspectives, student behaviors, and rotation activities focusing on Standard 4 outcomes. Frequencies and descriptive statistics were generated for quantitative data. Open-ended responses were analyzed using a general interpretivist approach, with inductive and deductive coding performed to explore the preceptor’s expectations and activities related to outcomes acquisition. **Results:** In total, 242 surveys were completed for a response rate of 54%. The majority of preceptors identified as female (54.5%), and community pharmacy was the most common practice setting (28.5%). The outcomes selected by preceptors as the most and least important were Professionalism (52%) and Innovation and Entrepreneurship (66%), respectively. Most rotations indicated that they provided students with opportunities to demonstrate Self-Awareness (79.8%). Qualitative analysis revealed considerable variation in the behaviors students needed to exhibit to demonstrate outcomes acquisition. Preceptors reported creative rotation activities and experiences to help students demonstrate and acquire Standard 4 outcomes. **Conclusions:** Explicit definitions of the educational outcomes and clear behavioral expectations may assist preceptors with ACPE Standard 4 assessment. Selected activities and experiences currently offered by some experiential preceptors will be highlighted as exemplary models to support student acquisition and preceptor evaluation of these outcomes.

**Extemporaneous Compounding Skills and Competence Progression from Undergraduate to Practice: A Pharmacy Education Perspective**

Quang Hung Duong, Monash University, Charles Xin, Monash University, Gabrielle Pang, Monash University, Rachel Roy, Monash University, Suzanne Caliph, Faculty of Pharmacy and Pharmaceutical Sciences, Monash University, Australia.

**Objective:** Entry-level pharmacists in Australia are expected to have had appropriate education and training and deemed competent to undertake extemporaneous compounding. Our study aimed to examine how pharmacy students, interns (provisionally registered pharmacists) and pharmacists perceived their training and competence in extemporaneous compounding. **Methods:** We conducted a self-administered survey with undergraduate pharmacy students, interns and registered pharmacists. Using a Likert-scale, participants ranked their level of confidence to undertake extemporaneous compounding of a selection of pharmaceuticals commonly encountered in practice settings. The data was analyzed using the Kruskal-Wallis test. Participants’ opinion on areas of improvement in training was recorded as free-text responses for qualitative analysis. **Results:** 27 undergraduates, 7 interns and 7 pharmacists participated in our study. There was no significant difference between perceptions of undergraduate students and graduate interns on their competence in compounding solutions, suspension, creams and ointments. Compared to students, pharmacists perceived themselves to be significantly more confident in compounding suppositories and pessaries (p=.013). Various factors contributed to participants’ perceptions such as frequency of practice and knowledge attained from pharmacy education. Suggestions for improvement in extemporaneous compounding teaching included more hands-on practical sessions, integration of theoretical knowledge (eg, formulation principles, clinical aspects), legislation, and fostering soft skills (eg, patient counseling). **Conclusions:** All three groups of participants indicated the level of undergraduate training to be a major factor affecting their skills and confidence in extemporaneously compounding these products, highlighting the importance and opportunity for undergraduate training in this topic area. Surveys can be a viable tool for graduate skill
and curricular improvement. Given the challenges of COVID-19 pandemic and practical training in pharmacy, research is needed to explore the potential for virtual learning in extemporaneous compounding.

Feasibility and Design of a National Preceptor Development Prototype

Angela M. Brownfield, University of Missouri-Kansas City, Craig Cox, Texas Tech University Health Sciences Center, Charlene Williams, University of North Carolina at Chapel Hill, Lindsay Davis, Midwestern University, Seena L. Haines, The University of Mississippi, Kerry Anne Rambaran, Scripps Mercy Hospital San Diego, Melissa J. Ruble, University of South Florida Taneja College of Pharmacy, Mary Douglass Smith, Presbyterian College.

Objective: The 2019-2020 American Association of Colleges of Pharmacy (AACP) Council of Faculties (COF) appointed a task force to assess the feasibility and design of a national preceptor development platform. Methods: In July of 2019, the Task Force convened to review charges while receiving input from the Chair Liaison. The Task Force brainstormed important aspects of design. By January 2020, core elements of the national platform were established and strategies for design were discussed. A one-hour focus group was held with members from the AACP Experiential Education Section to garner qualitative feedback. Finally, a comprehensive report was submitted for consideration by the AACP Board of Directors. Results: Core elements of the platform were established and placed into four main categories: global considerations, design, content, and engagement. The central goal of the platform would be individualized continuing professional development (CPD) using a self-directed assessment seeking (SDAS) approach. Clear delineation of development and potential impact were explored while considering future steps and needed resources. The Task Force uniformly concluded that AACP could serve as a visionary steward of this platform to facilitate significant behavioral change. Identified challenges included: cost, time, synergy with existing preceptor development programs, effective marketing, and technology resources. Conclusions: To our knowledge, this would be the first preceptor development platform that aims to offer diverse content, engagement opportunities, as well as the SDAS approach. The envisioned platform would illustrate precepting as a lifelong journey with a holistic perspective to ensure relevance to a broad audience. The platform design would be flexible to create potential value for diverse stakeholders including student and resident pharmacy preceptors, other health professional preceptors, and be viable for both a national and international audience.

Frequency of Essential Elements in Required Advanced Pharmacy Practice Experiences (FEER - APPE)

Adam B. Woolley, Northeastern University, Elizabeth St.Louis, The University of Rhode Island, Jennifer Luciano, University of Saint Joseph, Brett Feret, The University of Rhode Island, Michael J. Gonyeau, Northeastern University, Lorelei Molchan, Northeastern University, Jenny Van Amburgh, Northeastern University, Debra Copeland, Northeastern University.

Objective: To evaluate student self-reported achievement of essential elements across three required APPEs and identify differences in the frequency of each essential element pre- vs. during-COVID. Methods: APPE students from three New England programs were assigned a self-assessment inventory after required acute care, ambulatory care, and community pharmacy APPEs between May 2018 and December 2020. Using a 4-point frequency scale, students reported exposure to and completion of essential elements. Pooled data were analyzed using Mann Whitney-U tests to compare differences in median frequencies of essential elements pre- and during-COVID. Median change frequencies were reported as combined data and compared between programs. Results: A total of 2191/2259 (97%) evaluations were completed. All pre-COVID APPEs were in person, however, during COVID APPEs shifted towards hybrid and remote formats in the acute and ambulatory care settings. Acute care only saw a statistically significant decrease in the frequency of reported Pharmacist Patient Care elements (p <0.05 combined) in Evidence-Based Medicine with no change in median frequency. There was a statistically significant decrease in the frequency of reported Pharmacy Preceptor elements during the pandemic demonstrated minimal change. Acute care was the most resilient to the impact of the pandemic whereas community pharmacy experienced the greatest change. This may be attributable to the difference in direct patient interaction during the pandemic. Ambulatory care was impacted to a lesser degree, potentially due to more telehealth options.

From Counter to Collaborative Technology: A Virtual Community Pharmacy APPE Experience During a Pandemic

John Orr-Skirvin, Northeastern University, Tayla Rose, Northeastern University, Danielle M. Miller, Northeastern University.
Objective: The School of Pharmacy transitioned several community Advanced Pharmacy Practice Experience (APPEs) students to a virtual format due to the COVID-19 pandemic. Our objective was to develop a virtual APPE to maintain programmatic quality and educational soundness while developing mastery of students’ essential elements.

Methods: Four faculty designed and executed a virtual community pharmacy APPE from March-June 2020. A typical day included two hours of faculty led activities: topic discussions, OTC/QuEST SCHOLAR-MAC activities, webinars, prescription counseling, operational topics, journal clubs, and pharmacy jeopardy. Students then had time for self-directed learning and reflective postings. Students and faculty met via Blackboard collaborate. Student feedback and satisfaction were collected prospectively via a Qualtrics survey.

Results: Twenty-nine students completed a virtual community APPE. The survey response rate was 80.6% (29 of 36 students). Students reported the mean percent time spent on faculty led activities: 42.8% topic discussions, 17.9% journal clubs and 10.2% patient care discussions. The mean hours per week working with preceptors was 10.2 (range 3-20), with other students 4.6 hours (range 0-17). Based on a scale of 0-10, overall satisfaction with the experience was a mean 7.7 (Range 3-10; SD 2.07) and over-all quality of activities was a mean 7.6 (Range 3-10; SD 1.79). Majority (68%) reported spending at least 35 hours a week on the virtual experience. Conversion to a virtual community APPE occurred with planning, collaboration and flexibility. Activities included a wide variety of individual and team-based activities with reflective discussions and peer-to-peer teaching. Activities enhanced the core community pharmacy functions which students completed during introductory pharmacy practice experiences as well as value-added service skills.

Conclusions: Conversion to a virtual community APPE occurred with planning, collaboration and flexibility. Activities included a wide variety of individual and team-based activities with reflective discussions and peer-to-peer teaching. Activities enhanced the core community pharmacy functions which students completed during introductory pharmacy practice experiences as well as value-added service skills.

From Wish to Reality: A Preceptor Program Framework That Connects Preceptor Well-Being to Student Well-Being

Jennifer Chang, University of Washington, Caitlin Blomquist, University of Washington.

Objective: To assess the effectiveness of preceptor well-being programming to influence adoption of well-being behaviors in practice and precepting. Methods: A preceptor CE program was designed to promote preceptor and student well-being through: 1. Preceptor self-reflection on importance of well-being; 2. Education about well-being behavioral practices; 3. Three-checkpoint framework (check-in, checkup, checkout) to integrate well-being practices into precepting; and 4. Preceptor plan to improve personal and student well-being. Through the CE program evaluation, participants assessed the program’s effectiveness and documented plans for improving personal and student well-being. Five months post-program, participants completed a survey addressing plan implementation and perceived impact of well-being practices. Results: 48% (n=62) of the 128 participants completed the CE program evaluation. The majority of these respondents indicated they were likely to implement practices to improve personal well-being (98%; n=61) and integrate well-being activities into their rotations to support students (97%; n=60). 47% (n=60) of the participants completed the post-program survey. 55% (n=33) of respondents implemented a personal well-being plan and 97% (n=32) of those who implemented a plan indicated it was slightly to very influential in improving personal well-being (scale from 1-5; 1=not at all influential to 5=extremely influential). 60% (n=36) of respondents implemented a plan for improving student well-being and 92% (n=33) of those who implemented a plan indicated the change was slightly to very influential in improving student well-being. Conclusions: Results demonstrate that preceptors who adopt well-being practices report positive impacts on personal and student well-being. Future research should examine how students perceive the impact of preceptor integration of well-being practices into rotations. The findings suggest an application-based framework can help preceptors integrate well-being into practice and precepting.

Health Fair Architects: The Nuts & Bolts of Creating Virtual Outreach Events Utilizing Telehealth Technology

Carly A. Ranson, University of the Pacific, May Lui, University of the Pacific, Nareeta Sharma, University of the Pacific, Purav Mehta, University of the Pacific, Vincent Ho, University of the Pacific, Marika Gonzales, University of the Pacific, Pauline Nguyen, University of the Pacific, Rajul Patel, University of the Pacific.

Objective: The abrupt shift to virtual learning caused by the COVID-19 pandemic required pharmacy schools to transition in-person experiential activities to virtual. Our objective is to describe the creation and implementation of student pharmacist-run virtual health fairs that provided Medicare Part D plan (PDP) optimization and Medication Therapy Management (MTM) services to Medicare beneficiaries. Methods: A survey was sent to previous attendees (n=2,754) of our Mobile Medicare Clinics (MMC) to assess
their access to, and comfort with, telehealth technology. Survey responses identified a preferred teleconferencing platform and training opportunities to best facilitate access to telehealth technology. A detailed approach was undertaken to create, test, modify, and re-test methods to best meet patients’ needs/concerns, including privacy protection, minimizing technical difficulties, and ensuring secure retrieval of post-intervention documents. Student and preceptor roles were defined and proper training for all participants was provided. Student perceptions were gathered from those who partook in both in-person (2019) and virtual (2020) MMC.

**Results:** In 2020, 10 virtual health fairs were held during which 808 Medicare beneficiaries from 10 states and Washington DC were assisted. Overall, 520 beneficiaries received PDP optimization and 324 received MTM services. The clinics involved 347 student pharmacists and 90 pharmacist preceptors. Student pharmacists completed 6,574 Introductory Pharmacy Practice Experience hours through their participation. **Conclusions:** The successful pivot from in-person to virtual health fairs allowed for the continued provision of services to Medicare beneficiaries and opportunities for experiential education. Consequently, virtual health fairs will be retained moving forward. The continued exploration of technological innovations enables educators to meet students’ experiential needs, while also providing services for the community at-large.

**Impact of Experiential Layered Learning Model on Student Clinical and Precepting Skills**

Lisa T. Hong, Loma Linda University.

**Objective:** This study evaluates the effect of a piloted layered learning model in the experiential setting on student self-perceptions of their patient care and precepting skills. **Methods:** APPE student played a significant role in the facilitation of IPPE training throughout each clinical rotation. IPPE and APPE students completed anonymous pre- and post-surveys evaluating perceptions of their own skills including aspects of the pharmacists’ patient care process, communication, application of clinical evidence, facilitation, and feedback. Means of the Likert scale scores were compared between pre-post surveys as well as between IPPE and APPE student cohorts with t-tests. **Results:** A total of 15 students (9 APPE and 6 IPPE students) completed the survey. APPE student perceptions of their clinical skills significantly improved ($p < .05$) whereas perceived improvement among the IPPE students was smaller in magnitude and not statistically different before and after their rotation ($p > .05$). Though the IPPE students tended to rate their own skills higher at baseline than the APPE students, IPPE students only showed a statistically significant perceived improvement in understanding disease states during topic discussions and clinical application of guidelines/practice literature. APPE student comfortability with precepting tended toward improvement ($p = .09$). At least 75% of both APPE and IPPE students agreed that APPE facilitation of learning improved their clinical skills and 100% in both groups agreed that APPE student feedback resulted in improved communication. **Conclusions:** This model may positively impact the patient care and precepting skills of our learners and could be easily be expanded for layered learning that includes students and residents.

**Implementing Yearly Professionalism Self Assessments in the Co-Curriculum**

April Staton, Auburn University, Kabre Heck, Auburn University, Kimberly Braxton-Lloyd, Auburn University, Lynn Stevenson, Auburn University.

**Objective:** To review the implementation of yearly Co-Curricular professionalism self-assessments and to make continuous quality improvements **Methods:** The Co-Curriculum (CC) consists of activities in advocacy, professionalism, leadership, and professional development. Students in their P1-P3 years were asked to complete a Professionalism Self-Assessment assignment to evaluate their own strengths and weaknesses regarding behaviors that reflect one of five Tenets of Professionalism including Responsibility, Honesty and Integrity, Commitment to Excellence, Respect for Others, or Professional Stewardship. This assignment is repeated each year to assess changes as students progress. Student responses from this assignment for the 2019-2020 academic year were collected and analyzed. **Results:** Across the P1-P3 years, students completed a Professionalism Self-Assessment. The Tenet that most students felt they needed to improve in was Commitment to Excellence (31.69%). The Tenet of Professionalism that most felt that they were excelling in was Respect for Others (30.69%) while the least was Professional Stewardship (responsibility to the profession, patients, and society) at 6.33%. Out of those who felt they were excelling in Professional Stewardship, there is variation between the years (P1s-P3s) that suggests more exposure to CC appears to be related to higher self-reported excellence in that Tenet (14.29% for P1 students versus 35.71% and 50% for P2 and P3 students, respectively). **Conclusions:** Analysis of the Professional Self-Assessment assignment provided feedback on the self-reported strengths and weaknesses of students in their P1-P3 years. The results of this analysis will allow for future assignments and competencies to be improved upon so that students begin to feel more confident in behaviors related to Professional and Commitment to Excellence.
Incorporating Simulation Into the Introductory Pharmacy Practice Experience (IPPE) in the Institutional Setting

Jane Shtaynberg, Fairleigh Dickinson University, Anna Nogid, Long Island University, Tina Verveniotis, Long Island University.

Objective: To describe the development and implementation of simulation activities into the institutional IPPE. Methods: The institutional IPPE at our institution has traditionally been delivered as a 4-week live on-site experience. Due to COVID-19 site restrictions, the course was re-formatted in Summer 2020 to replace 40 course hours with simulation. Simulation activities were designed to meet standard course expectations and competencies. Activities included collecting and analyzing patient information via an electronic health record, developing and documenting a plan of care using SOAP note format, preparing products for intravenous administration, and developing and delivering a presentation on an administrative topic. Following simulation week, students were asked to complete a survey regarding their perceptions of the simulation activities and their readiness to start IPPEs. Student performance during the remaining on-site hours was evaluated using existing course assessments. Results: Of the 161 students who received the survey, 56 (35%) responded, and 36 completed the survey. Respondents (91.67%) felt that simulation activities were valuable to their learning experience. After completion of simulation activities, there was an increase in the percentage of students who reported feeling prepared or very prepared to participate in direct patient care activities (41.67% vs. 63.89%), document direct patient care activities (61.11% vs. 77.78%), identify adverse drug reactions (63.89% vs. 83.33%), prepare intravenous compounds (52.77% vs. 66.67%), prepare a formulary review (41.67% vs. 58.33%), and participate in committee meetings (58.33% vs. 69.44%). Preceptor evaluations of student performance during the IPPE showed that all students were successful in meeting course expectations and competencies. Conclusions: Incorporating simulation into an institutional IPPE may be utilized to increase student perceived readiness for in-person activities while allowing students to successfully meet course expectations.

Inter-institutional COVID-19 Simulation During a Remote Acute Care Advanced Pharmacy Practice Experience

Michael W. Perry, Duquesne University, Lawrence Kobulinsky, University of Pittsburgh School of Pharmacy, Amy Seybert, University of Pittsburgh, Madeline Kreider, University of Pittsburgh, Victoria Williams, University of Pittsburgh, Pamela L. Smithburger, University of Pittsburgh School of Pharmacy.

Objective: Develop a simulation collaborative between two schools of pharmacy during a remote acute care advanced pharmacy practice experience (APPE) that enhances student confidence, knowledge and critical thinking surrounding the care of a critically ill patient with COVID-19. Methods: Faculty and staff from the Duquesne University and the University of Pittsburgh Schools of Pharmacy created a simulation collaborative which focused on the care of a critically ill COVID-19 patient. Students on remote, acute care APPE rotations from both universities worked together in co-mingled teams and completed two educational electronic health record reviews, complex simulation sessions, and debriefs focused on the care of a critically ill patient with COVID-19. Individually, students completed two educational electronic health record reviews and verbal patient presentations prior to and after the simulation sessions. Student knowledge surrounding COVID-19 acute principles as well as critical thinking were assessed through pre/post case-based multiple-choice examinations and an intermittent clinical examination (ICE). Student confidence and perceptions were gathered through anonymous pre/post surveys. Results: For the case-based knowledge examination, there was a statistically significant improvement from baseline to the final assessment (median [range]: 21.15 [19-23] vs median [range]: 26 [23-28]; p < .001). For the total ICE total scores improved from baseline (median [range]: 33 [28-36] vs median [range]: 36.5-29.5-43.52; p = .004) as well as the objective (p < .001), plan (p < .001), and monitoring (p < .001) scores. Student confidence improved from baseline in all domains assessed. Conclusions: Remote simulation sessions improve student knowledge, critical thinking and confidence and provided an opportunity for students to gain exposure caring for critically ill COVID-19 patients in a safe environment. Collaboration between schools of pharmacy can be successfully employed to leverage resources and expertise to expand opportunities for students.

Learner Perceptions of Early COVID-19 Impact on Advance Pharmacy Practice Experiences

Angela L. Goodhart, West Virginia University, Megan Adelman, West Virginia University, Lena Maynor, West Virginia University, Douglas Slain, West Virginia University, Mark Garofoli, West Virginia University.

Objective: COVID-19 changed the landscape of experiential learning. Early in the pandemic, Schools of Pharmacy nationwide needed to adjust experiential training to meet the needs of students and healthcare institutions, with no
clear standards regarding how to adjust and modify learning experiences. Learners were still expected to meet the required 1440 hours of advanced pharmacy practice experiences (APPEs) despite the landscape looking different. The purpose of this evaluation was to assess learners’ perception of rotation changes and school communication as well as COVID-19 implications on rotation evaluations early on in the pandemic.

**Methods:** A survey was completed by fourth year student pharmacists after completion of their APPEs in spring 2020. Preceptor evaluations of learners pre- and post-COVID were also evaluated. **Results:** Sixty final-year student pharmacists completed the survey. Approximately half of respondents (51.1%) indicated their APPE rotation schedule was changed for block nine. Twenty-four (51.1%) student pharmacists completed their hours remotely, 15 (31.9%) student pharmacists completed all hours in-person, and eight (17%) student pharmacists completed a combination of in-person and remote activities. Learners perceived activities such as topic discussions, COVID discussions and drug information questions, patient work-ups and discussions, patient outreach and education, and teaching opportunities were beneficial to their learning. Interestingly, some learners believed remote work should be considered in the future for APPE rotations and/or activities. Overall, limited differences in preceptor evaluations of student pharmacists and final grades were noted. **Conclusions:** Student pharmacists overall had positive comments regarding the changes to experiential education, including the communication and responsibilities/activities. There are multiple areas where Doctor of Pharmacy programs can continue to modify and innovate as the current pandemic situation continues.

### Learning Skills with Opioid Use Disorder and Naloxone through Linking Didactic and Experiential Activities


**Objective:** To describe the development and impact of a novel, integrated didactic-experiential learning model on student pharmacists’ knowledge, abilities, confidence, comfort, and intention to provide naloxone to patients prescribed opioids. **Methods:** A model consisting of lecture-based education, skills lab, and Community Introductory Pharmacy Practice Experiences (IPPEs) was developed to enhance first-year student pharmacist education surrounding opioid misuse identification and naloxone services implementation. Lectures included 1.5 hours of content on opioid and naloxone pharmacology, overdose risk factors, and the state-wide naloxone standing order. A one-hour skills lab focused on mock patient counseling and preparing/demonstrating naloxone dosage forms. Subsequent 3-week Community IPPEs emphasized classroom and lab content through completion of naloxone service-related activities. Student knowledge, abilities, confidence, comfort, and intention to provide naloxone services were measured via online survey pre-and post-lecture/lab as well as post-IPPE using multiple choice (knowledge) and Likert-type scale items (1 = strongly disagree, 4 = strongly agree). Changes were analyzed using Friedman's ANOVA (alpha = 0.05). Frequency of naloxone service IPPE activities was also assessed. **Results:** Of 147 students, 126 completed all surveys. Mean (SD) student knowledge increased from 62.07% (16.49) correct pre-lab to 80.42% (13.84) post-lab ($p < .001$). Increases were also seen in mean (SD) confidence (pre = 2.4[0.88], post-lab = 3.53[0.44], post-IPPE = 3.71[0.53]; $p < .001$), comfort (pre = 1.95[0.73], post-lab = 3.55[0.45], post-IPPE = 3.62[0.44]; $p < .001$) and intention to provide naloxone (pre = 3.29[0.63], post-lab = 3.55[0.44], post-IPPE = 3.58[0.36]; $p = .035$). The most frequent IPPE activity was identifying a patient who could benefit from receiving naloxone (n = 249). **Conclusions:** Linking didactic learning to experiential activities improved student pharmacists’ knowledge, abilities, confidence, comfort, and intention to provide naloxone. While effective, this model required coordination between multiple faculty members which can be cumbersome. Additionally, IPPE practice site heterogeneity and the COVID-19 pandemic caused variability in activities.

### Nationwide Impact of COVID-19 on the Advanced Pharmacy Practice Experiences of 2020 PharmD Graduates


**Objective:** To clarify and quantify the national impact of COVID-19 on APPE students who had a projected summer 2020 graduation date. **Methods:** A survey instrument was designed to assess the impact of COVID-19 on the students who completed their final APPE rotations in March-May 2020. This survey assessed rotation schedule changes, teaching and patient care methods, perceived rotation quality, and timeliness of graduation. The survey link was distributed via email to members of the AACP EE Section to be distributed to the corresponding 2020 graduates. **Results:** 425 individuals responded to the survey. During March-May of 2020, a change to the original APPE schedule was implemented for 76.1% of respondents; 37% indicated the
rotation changed from in-person to remote. In-person communication with preceptors dropped from 96.5 to 41.2% during this time, while telephonic communication increased from 26.4% to 50.5%. The use of videoconferencing increased from 15.3 to 65.2%. A decrease in both patient and provider interaction was noted by 72.8% and 63.1% respectively. The respondents also reported a change in technology usage in March-May 2020 rotations (70.3%), yet only 26.2% reported that it enhanced communication. New health precautions were implemented for 64.8% of respondents. A decrease in rotation quality was reported by 45% compared to previous rotations. On-time graduation occurred for 89.4% of respondents; 10% were delayed due to COVID-19. Conclusions: In March 2020, APPE students nationwide noted several noteworthy changes to their learning experiences.

**Patient Perceptions of a Student-Led Remote Hypertension Education Program**

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**Objective:** The primary objective was to describe patient perceptions of participating in a student-led, remote hypertension education program. The secondary objective was to gain insight on perceptions of the program’s impact on current lifestyle. **Methods:** Second- and third-year pharmacy students collaborated with two pharmacies to develop and implement a student-led remote hypertension education program. Students worked with faculty preceptors to develop an eight-week curriculum that they later delivered to patients telephonically. During each call, students collected blood pressure readings, educated on a topic and set S.M.A.R.T. goals. After completing the program, participants were interviewed regarding their experience. The study was a qualitative design using semi-structured interviews, conducted by trained investigators. Interviews were recorded, transcribed, and thematically coded. **Results:** Twelve participant interviews were conducted with six dominant themes identified. Themes were: (1) students were knowledgeable, professional, and engaged; (2) the program was organized; (3) participants felt comfortable communicating with the students and developed a positive relationship; (4) participants expressed increased interest in the program due to student involvement and the opportunity to impact the students’ education; (5) The remote nature of the program was convenient, but face-to-face interaction was missed and (6) participants reported positive lifestyle changes or reinforced habits that they plan to continue. **Conclusions:** Overall, participants were satisfied with the program and enjoyed that it was student-led. This program offered an innovative patient care experience for students during the COVID-19 pandemic while also expanding patient access to education services. This model could serve as a framework for pharmacy students to deliver patient education in collaboration with community pharmacies, with possible expansions to more rural pharmacies and other disease states. Future studies should evaluate impact on student learning outcomes.

**Pharmacy Resident Perspectives on the Layered Learning Practice Model**

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**Objective:** To describe pharmacy resident perspectives on the layered learning practice model (LLPM) at large academic medical centers. Unlike clinical outcomes and student/preceptor perceptions of the LLPM, pharmacy resident perspectives are not as well-defined in the literature. Types of LLPM training were also investigated. **Methods:** Participation was solicited from academic medical centers via membership in Vizient®, a national health system consortium, to identify large, academic medical centers with PGY1 and PGY2 programs. Residents from these institutions with at least 4 weeks of precepting experience were eligible to complete an online survey. Descriptive statistics were generated for demographic and Likert scale data. Themes were identified from narrative free responses. **Results:** Twenty-seven resident responses from ten institutions were included. Likert data showed a generally positive perspective toward overall experience in the LLPM and perceived LLPM impact on clinical knowledge and professional practice, with 100.0% of respondents agreeing that they enjoyed precepting under the LLPM. However, 44.4% also agreed that precepting students was stressful. LLPM impact on resident behavior received positive to neutral responses; 63.0% neither agreed nor disagreed that the LLPM changed their approach to patient care. Written comments revealed themes such as sources of stress, increased depth of learning, comprehensive patient care, and professional growth. The most common forms of LLPM training included orientation and student/preceptor evaluations. **Conclusions:** These findings identified a variety of resident perspectives of the LLPM ranging from positive to negative and also revealed possible areas of improvement related to LLPM implementation. Residency programs may consider exploring stressors on the resident role in the LLPM to better structure resident precepting training and maximize their clinical learning experience.
Preceptor Analysis and Development via the CliftonStrengths Assessment Tool
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Objective: The purpose of this study is to describe the Signature Themes and domains of one university’s preceptor pool, compare the results by preceptor type, and describe and assess a preceptor development activity based on these findings. Methods: This cross-sectional study included preceptors registered with the Manchester University Pharmacy Program. Following completion of the CliftonStrengths assessment, data regarding preceptors’ top 5 Signature Themes was retrieved. Responses were then classified by preceptor rotation type and Signature Themes were grouped by domain to determine differences among preceptor groups. A live professional development session was then offered to all participants to learn, from a certified Strengths Coach, the meaning of their results and how to utilize them in their precepting. Descriptive statistics were used to describe preceptor demographics and results for most endpoints. A univariate chi-square test or Fisher exact test, as appropriate was utilized. Results: The top five Signature Themes found among participants were Harmony (41%), Learner (39%), Achiever (35%), Responsibility (30%), and Intelllection and Relator (both 23%). The only detected difference in theme domain was found in the Influencing domain, where acute care preceptors were less likely to possess a theme in this domain compared to other pharmacists (16% vs 45% \( p = .028 \)). Preceptors provided a favorable evaluation of the live development session. Conclusions: The Signature Themes of pharmacy preceptors appear to be similar to the themes found in previous studies of pharmacy students and residents. As this was an initial pilot study, additional studies are needed to determine if these results can be extrapolated to pharmacy preceptors in general, and if there are additional, undetected differences among preceptor groups, as well as long term effects of the live development session.

Preceptor Perceptions of a Novel IPPE to Increase Student Preparedness Before APPEs
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Objective: An Introductory Pharmacy Practice Experience (IPPE IV) was designed to provide 16-hours of case-based experiences with clinical faculty during April-May 2020 immediately preceding Advanced Pharmacy Practice Experiences (APPEs). The objective of this study was to assess faculty preceptors’ perspectives regarding the IPPE IV experience and student preparedness for APPEs. Methods: Faculty preceptors completed two post-IPPE IV surveys: one immediately following the IPPE IV to assess logistics and one after the second APPE (10 weeks later) regarding perceptions of students’ preparedness. Data from quantitative items was analyzed descriptively. Data from qualitative open-ended questions was analyzed using a content analysis approach, with in vivo coding used to identify overarching categories of response. Results: Preceptors (n = 18) described IPPE IV benefits as providing students with an opportunity to experience real-world APPE expectations and interacting with students to provide feedback. Most preceptors believed 16 hours was adequate (n = 13, 72%), an 8-hour day was optimal compared to a 4-hour day (n = 14, 78%), and placement at the end of the P3 spring semester was appropriate compared to earlier in the curriculum (n = 14, 78%). Preceptors noted keeping group sizes smaller (\( \leq 4 \) students) allowed for more individualized attention, facilitated peer-to-peer feedback, and small group discussion. Preceptors (n = 12, 67%) indicated students were more prepared at the beginning of APPEs compared to past students who did not complete an IPPE IV. Specifically, students made a stronger first impression, required minimal direction in case preparation/presentation, and were more knowledgeable/comfortable with the electronic medical record. Conclusions: IPPE IV was beneficial for setting APPE expectations for students and provided a beneficial transitional experience from the didactic environment to the APPE real-world pharmacy practice setting.

Preceptor Perceptions of the Individual Teamwork Observation and Feedback Tool (iTOFT)
Amanda Margolis, University of Wisconsin-Madison School of Pharmacy, Shweta Shah, University of Wisconsin-Madison, Beth Martin, University of Wisconsin-Madison.

Objective: During the 2018-2019 experiential year, the validated individual teamwork observation and feedback tool (iTOFT) was introduced for preceptors to give formative feedback to advanced pharmacy practice experience (APPE) students and to document interprofessional teamwork behaviors. Completion and documentation of the iTOFT activity was required for acute and ambulatory care APPEs. The purpose of this assessment was to understand preceptor perspectives on using the iTOFT tool. Methods: A preceptor survey was administered containing 7 questions to assess appropriateness and feasibility of the iTOFT activity using a 4-point scale. The survey also...
Predictors of Anxiety, Mood Impairment, and Coping Strategies in Pandemic-Period APPE Students: National Survey Results

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Objective: To quantify predictors of self-reported mental health changes in Advanced Pharmacy Practice Experiences (APPE) students during the coronavirus-19 (COVID-19) pandemic. Methods: A Qualtrics survey was emailed to AACP Experiential Education (EE) Section members for distribution to 2020 graduates. Using a 3-point Likert scale comparing pandemic-period (March-May 2020) with previous APPE rotations (better, about the same, worse), students characterized changes in anxiety; mood; stress-relieving strategies (eg, exercise, meditation; and adaptability. Predictors included practical concerns (eg, finance, graduation, licensing); concern about physical health, and personal experience with COVID-19 in self, family, or close friend. Results: Of 359 respondents, 163 (46.2%) reported worsened anxiety, 166 (46.2%) worsened mood, 95 (26.5%) better adaptability, and 75 (20.9%) better stress management. Respondents reporting financial concern were significantly (p<.05) more likely than those without to describe worsened anxiety (60.0% vs. 41.7%, respectively) and mood (58.6% vs. 43.1%). Also, significantly associated with worsened anxiety were concern about graduation (50.8% vs. 40.0%), rotation quality (55.8% vs. 36.6%), licensing (54.5% vs. 39.8%), postgraduate employment (52.0% vs. 39.2%), and physical health (67.8% vs. 30.0%). Personal experience with COVID-19 was weakly associated with improved adaptability (34.3% vs. 22.5%). In adjusted analyses, practical concerns multiplied odds of worsened mood 2- to 3-fold (odds ratio [OR]=3.62, 95% confidence interval [CI]=1.55-8.46 for >4 concerns compared with none). Concern over physical health was the only significant predictor of worsened anxiety (OR=4.29, 95% CI=2.53-7.27). Conclusions: APPE students experienced pandemic period declines in anxiety and mood, chiefly predicted by practical concerns and physical health.

Student and Preceptor Perceptions of the Effectiveness of a Formal Mock Interview Program

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Objective: The objective of this project was to determine if students and preceptors found the formal mock interview process beneficial and identify areas of improvement for the process. Methods: Three mock interview dates were set based on student preference and preceptors were then asked to volunteer for one or more interview dates. The dates included options for both phone and virtual mock interviews. Pre-surveys were sent to both students and preceptors via email. After students completed a 4-item pre-survey and preceptors completed a 7-item pre-survey, students and preceptors were matched based on what the student planned to pursue following graduation and clinical interests if noted. Following the interview process, students were emailed a 9-item post-survey and preceptors were emailed a 13-item post survey to obtain the feedback on the process. Results: 80 mock interviews and 57 phone interviews were completed. 15 students and 35 preceptors participated in the interview program and completed both the pre- and post-surveys. On the pre-survey, 75% of students and 100% of preceptors felt the process would be very helpful. Of the 35 preceptors, 17 said they felt the program was completely effective. Of the improvements suggested, preceptors felt students could use improvement on CV and situational questions. Of the 15 students, most students had suggestions for improvement. Of improvements suggested, students felt the program could have had more clear scheduling and would have liked more practice questions ahead of time. All the preceptors and students that completed the post-survey found the process beneficial. Conclusions: Overall, students and preceptors both found the 3-day virtual mock interview process to be beneficial.
Student Experiences on an Advanced Pharmacy Practice Experience Virtual General Medicine Rotation

Anna Kabakov, Midwestern University, Andrew Merker, Midwestern University.

Objective: Most presentations on advanced pharmacy practice experience (APPE) rotations are held in-person at the student’s respective rotation institution. The need to hold virtual presentations to large groups of students has been limited and therefore, limited data exists to support these experiences for students. The Coronavirus pandemic facilitated the need for increasing virtual aspects of APPE rotations as many institutions limited the number of students on-site or cancelled the general medicine APPE rotation altogether. Our objective was to evaluate student experiences and preferences on a virtual component of an APPE rotation. Methods: Fourth-year pharmacy school students on their APPE general medicine or clinical specialty rotations were eligible to participate. The students met virtually with the virtual preceptor for five consecutive Fridays. The first three weeks included topic discussions and the last two weeks were dedicated to journal clubs and case presentations. The students were offered a survey after their last virtual session to assess their experiences on this virtual rotation component. Results: Twenty-eight students completed the survey. Twenty-five students had in-person topic discussions on a previous APPE rotation, with 15 respondents (60%) who stated their ability to understand the material improved virtually. For those who attended journal clubs (n = 19) and case presentations (n = 20), virtual was slightly favored over in-person for both presentation types (47.4 vs. 31.6%; 45 vs. 40%, respectively). Conclusions: Overall, more students preferred virtual learning experiences for topic discussions, journal clubs, and case presentations. Other institutions may explore providing more virtual APPE learning experiences and presentations in order to enhance the student experience and increase the number of attendees at each presentation.

Student Pharmacist Collaboration with Loma Linda University Health Employee Health (LLUHEH) Tracking COVID-19 Exposures

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Objective: We aimed to describe the active role of student pharmacists in an emergency-formed “COVID-19 Call Center” supervised by LLUHEH director and pharmacy faculty to track and advise employees potentially exposed to COVID-19-positive patients or colleagues. Methods: In March 2020, the COVID-19 pandemic led to suspension of many experiential rotations due to restrictions at clinical sites. During this time, a significant number of healthcare workers were exposed to confirmed or suspected COVID-19 patients or colleagues in the front line. A group of fourth-year student pharmacists collaborated with LLUHEH to serve at a newly-formed COVID-19 Call Center located within the School of Pharmacy to track the exposed employees and direct them to the workers’ compensation hotline for further medical instructions based on CDC guidelines at the time. Results: The LLUHEH director and pharmacy faculty facilitated student development of risk assessment algorithms, tracking protocols, phone interview scripts, and notification letters. Students contacted potentially exposed employees via phone and email. Between March and May 2020, 63 confirmed COVID-19-positive patients were identified in our medical center and clinics, potentially exposing 1914 healthcare employees. During this period, 32 confirmed COVID-19-positive employees potentially exposed 578 colleagues, with significant increase from March to April. However, the rate of positive cases in employees remained steady from April to May. Conclusions: This experience demonstrates an innovative, interprofessional approach amidst the COVID-19 pandemic crisis which allows fourth-year pharmacy students to provide significant service as part of the COVID-19 Call Center team to track and direct exposed healthcare employees during their rotation.

Student Self-Evaluations: A Comparison of Preceptor and Student Perceptions and Practices

Ashley N. Pugh, Union University College of Pharmacy, Mark A. Stephens, Union University College of Pharmacy, Kim A. Lindsey-Goodrich, Union University College of Pharmacy.

Objective: Per ACPE Accreditation Standards 2016, students should accurately self-assess knowledge and skills. Our objective was to assess preceptor and student perceptions of student self-evaluations (SSEs) and impact of SSE letter grades on preceptor evaluation of student (PES) letter grades. Methods: Preceptors of at least two students in the past year were included, and 102 preceptors were emailed a 25-item survey regarding perceptions and impact of SSEs. Results were compared to a 13-item survey assessing...
SSEs previously completed by students. **Results:** The survey was completed by 55 (53.9%) preceptors and 86 (61.9%) students. Preceptor perceptions included 67.3% who believed SSEs are very or extremely important, and 83.6% often or always reviewed SSEs. Letter grades in SSEs were considered very or extremely important by 29.1% of preceptors. Fewer preceptors (10.9%) than students (76.7%) agreed that SSEs are completely truthful. More preceptors (38.2%) than students (7%) agreed that students gave themselves better grades than deserved while more students (36%) than preceptors (16.4%) agreed students assigned lower grades than deserved. More preceptors (32.7%) than students (8.1%) agreed that SSEs should include letter grades. Over half of preceptors (56.4%) agreed SSE grades at least sometimes influenced their grading. Influence sometimes resulted in better grades (32.7%) or lower grades (16.4%) on PES. For students, 25.6% believed their SSE grades influence preceptor grades. **Conclusions:** Most preceptors believed SSEs are important, and a majority reviewed them. There was variability in perceptions of SSE truthfulness. While few preceptors believed SSEs are completely true, over half allowed SSEs to influence PES letter grades. Despite preceptors preferring letter grades, removal should be considered due to potential untruthfulness and influence on both PES and SSE letter grades and student preference.

**Students’ Reflections on Learning Experiences in Federally Qualified Health Centers**

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**Objective:** Fourth professional year student pharmacists participate in advanced pharmacy practice experiences in multiple settings, which offer different opportunities for learning and growth. Federally Qualified Health Centers (FQHCs) provide care to patients with unique health and socioeconomic challenges. The objective of this study was to examine the impact of an ambulatory care pharmacy practice experience at a FQHC on student pharmacists’ learning.

**Methods:** Fourth professional year student pharmacists submitted weekly reflections about their experiences during a four-week rotation at a FQHC. The reflections were structured using the Driscoll method of reflection, which includes reflecting on an activity, examining its effect on learning and growth, and discussing the impact this activity would have on future experiences. Two reviewers coded the reflections and qualitatively analyzed them to identify themes related to learning and professional growth. **Results:** Student pharmacists (N = 8) reflected upon a variety of topics while completing a rotation at a FQHC. Fifteen themes and 11 sub-themes were identified within the reflections. Reflections covered three general areas: 1) types of experiences students participate in at a FQHC, such as topic discussions and chronic disease state patient visits; 2) the current and future influence of those experiences on student learning or patients’ health; and 3) students’ emotional reactions during the experience. **Conclusions:** The reflections demonstrated that rotation experiences at a FQHC contributed to students’ growth in the areas of communication, collaboration, and empathy. Additionally, the students described gains in confidence, skills, and knowledge throughout the rotation. Student reflections can be used not only as a way to assess student growth, but also to improve rotation experiences by identifying additional learning activities and reinforcing the inclusion of existing activities.

**Utilizing Entrustability Levels for Self-Assessment of Pharmacy Operations and Practice Skills Performance on Institutional IPPE**

Kelly Bach, Albany College of Pharmacy and Health Sciences, Laurie L. Briceland, Albany College of Pharmacy and Health Sciences.

**Objective:** Most students enter the institutional Introductory Pharmacy Practice Experience (IPPE) without prior hospital experience. We were interested to learn how IPPE student learners on an institutional IPPE would self-assess their own baseline and subsequent gains in learning, and their perceived need for preceptor supervision, utilizing levels of entrustability. Entrustable professional activities (EPAs) encompass core responsibilities in which trainees should attain sufficient performance competency prior to entry into professional practice. Our aim was to evaluate the IPPE student’s self-assessment of their abilities and knowledge of institutional pharmacy practice prior to and after completion of the IPPE. **Methods:** An eight-question pre- and post- IPPE survey pertaining to institutional pharmacy operations and practice skills was distributed to ten institutional IPPE students at one hospital during summer 2020. Three levels of entrustability were utilized for student’s self-assessment: level 1 (observe), level 2 (perform with direct, proactive supervision), and level 3 (perform with reactive supervision, on request and readily available). **Results:** Ten students (100%) completed the pre-survey with 80% completing the post-survey. Prior to their IPPE, 50% of students worked in community pharmacy, 20% in institutional pharmacy, and 30% did not work. When comparing pre- and post- survey results, for the 14-item Pharmacy Operations question, students’ EPA level increased from 1.1 to 2.5 (p < .003), indicating decreasing need for supervision; for the 16-item pharmacy skills, EPA level increased from 1.9 to 2.9 (p < .001). **Conclusions:** Based
on student self-assessment, the institutional IPPE affords students ample growth toward practice competency in pharmacy operations and skills, underscoring the vital preceptor role and curricular importance of the institutional IPPE. Future aims are to fill in identified gaps in perceived learning/skills development, and to compare student and preceptor assessments.

Utilizing Virtual Gaming to Engage Students in an Introductory Pharmacy Practice Experience (IPPE) Debrief Session

Jane Shtaynberg, Fairleigh Dickinson University, Anna Nogid, Long Island University, Eric Ocheretayner, Long Island University.

Objective: To determine if a “Family Feud” game can effectively engage students during a virtual debriefing session. Methods: During fall 2020 semester, students enrolled in an IPPE course participated in a debriefing session. The session was conducted virtually via Zoom using a Family Feud gaming approach. Students were assigned to groups (“families”) of 12-13 students. Students first met in breakout rooms to discuss responses to questions based on information taught, observed, and completed by students via assigned activities during the course. Families then utilized their responses to compete in a Family Feud game. Following the session, a voluntary survey was administered. Exempt status was granted by IRB. Results: Of the 217 students in attendance, 125 responded to the survey (58%). Overall students had positive feedback about the activity and their level of engagement. Participants reported being engaged all or most of the time during the breakout and large group portions (96%, 92% respectively). Joy, excitement, and surprise were the most commonly reported emotions experienced during the game. For those who felt stressed/overwhelmed, timing of the session (during finals week) and timed nature of the game were the most reported contributors. Respondents preferred the game over traditional classroom activities (Agree/Strongly Agree = 87%) and would like to see it incorporated into other courses (Agree/Strongly Agree = 85%). Additionally, the activity was perceived as being an effective way to review course material (Agree/Strongly Agree = 94%), encourage thinking about course material in a new way (Agree/Strongly Agree = 90%), learn from peers (Agree/Strongly Agree = 91%), and learn new information not known prior to the session (Agree/Strongly Agree = 84%). Conclusions: Virtual Family Feud style game can be an effective and enjoyable method of engaging students during debriefing and other similar sessions.

Virtual APPE Grand Rounds: A Learning Activity to Enhance Remote Rotations During the COVID-19 Pandemic

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Objective: To assess students’ perception of a virtual learning activity developed for a remote Advanced Pharmacy Practice Experience (APPE) during the peak of the coronavirus disease 19 (COVID-19) outbreak in New York City. Methods: Due to the pandemic, many clinical APPEs were converted to remote elective experiences during the final 5-week rotation block (April 1 to May 6, 2020). A small group of faculty developed and piloted a virtual learning activity (APPE grand rounds) to enhance learning in this setting. Students assigned to participating faculty were tasked to develop 60 to 90-minute presentations scheduled 2-3 times weekly for large synchronous e-learning experiences across various simultaneous rotations. A questionnaire consisting of nine items utilizing a 5-point Likert scale was developed and administered to assess student perception of the virtual format, presentation skills, and overall satisfaction of the experience. Results: Twenty-four students participated in the pilot program and completed the survey. The majority of students (95.8%) agreed that the pilot program provided an effective format to review clinical topics and disease states. Additionally, the majority of students (87.5%) felt this experience allowed them to further develop presentation skills and feel more comfortable presenting to a large audience. Overall, students (83.3%) agreed this pilot program should be continued as part of APPEs. Conclusions: Implementation of a virtual APPE grand rounds learning activity was well-received by participating students. The integration of e-learning in APPE rotations may enhance the student’s experience and warrants further evaluation, especially during emergent public health circumstances.

LIBRARY AND INFORMATION SCIENCES

Adding Drug Information Questions to IPPE Simulation to Improve Student Pharmacists’ Confidence

Kayce Gill, Lipscomb University, Robin Parker, Lipscomb University, James Torr, Lipscomb University.

Objective: We aimed to implement and assess the effectiveness of incorporating drug information questions in an IPPE simulation on first-year student pharmacists’ perceived
Methods: During the Fall 2019 semester, drug information questions were incorporated into a 5-week, simulated introductory pharmacy practice experience (IPPE) course for first-year student pharmacists. Each week, student pharmacists answered a series of three drug information questions using various drug databases and PubMed. As the course progressed, the questions moved from basic questions such as what is a long-term complication from smoking tobacco to more advanced questions such as what supplement has been deemed "possibly effective" for smoking cessation. Each week, the college’s health sciences librarian and a pharmacy practice faculty member demonstrated their preferred methodology for answering the questions and provided feedback on student performance. A non-validated survey assessed confidence at the beginning of the course and at the end of the IPPE block. Results: A total of 73 (98.6%) of first-year student pharmacists completed the pre- and post-activity surveys. Confidence related to appropriate resource utilization increased in all four areas assessed, including answering medication-related questions (p<.05), using PubMed (p<.05), evaluating health information on the Internet (p<.05), and applying medication information to patient care scenarios (p<.05). Conclusions: Incorporating drug information questions with guided feedback from the college’s librarian and pharmacy faculty into an IPPE simulation significantly increased pharmacy students’ confidence in their abilities to use appropriate resources.

Branch Chain “Choose Your Own Adventure” Simulated Debates for Engaging Drug Use Misconception Argumentative Writing

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Objective: Argumentative writing on complex healthcare problems like how to address drug use and legalization involve acknowledging valid objections and developing persuasive counterarguments to advocate for a potential solution. However, many students struggle with the misconceptions that complex healthcare problems have one “correct” answer and that acknowledging objections in their writing weakens their arguments, resulting in only 13% of undergraduate research papers including counterarguments. We hypothesize that a branch chain simulated debate will engage students in scholarly conversation on healthcare to improve argumentative writing. Methods: Undergraduate students enrolled in a writing course on drug use in American culture completed a branch chain simulated debate assignment that identified individual perspectives on recreational marijuana legalization, posed an objection to that view, and tasked students to develop a counterargument to the objection. Historical controls of students writing a traditional argumentative assignment were used to compare student argumentative writing performance, research paper argumentative wiring, and exit survey data. Results: Branch chain implementation increased the incidence of counterarguments in research papers (13.87% vs 36.63%), including a >4X increase in counter-evidence in analytical research papers (4.9% vs 21.2%). Exit survey response to “What will you remember about this course five years from now?” saw >40X impression on complexity of drug legalization/regulation (0.7% vs 29.0%, p<.005) and a 67.9% increase in impression on literary research process (7.6% vs 12.76%, p=.08). Conclusions: Branch-chain simulated debates on American drug use engages students in more complex argumentative writing and emphasizes the complexity of drug legalization/regulation and the importance of literary research.

Introducing Student Pharmacists to the Skills and Benefits of Project Management in an Informatics Course

Sarah P. Collier, Lipscomb University College of Pharmacy, Elizabeth A. Breeden, Lipscomb University.

Objective: To introduce fundamentals of project management to second-year student pharmacists and evaluate their perceptions regarding project management utilization in pharmacy training and practice. Methods: Student pharmacists (n=67) were introduced to project management methodology and resources in a two-hour didactic lecture and team-based project management simulation. Ten student groups evaluated the purchase of barcode scanner technology for use in a community pharmacy. Assuming the role of project managers, each team identified a leader and a stakeholder liaison to manage the project. Groups applied didactic concepts and created Gantt charts to complete the activity. A subset of students participated anonymously in pre-and post-survey instruments analyzed in an aggregate. Results: Student perceptions were collected for research purposes in survey instruments at the beginning (n=43) and conclusion (n=28) of the session. Student response indicated an increase in participant confidence in the ability to explain project management (pre-7% to post-42.9%). Student awareness of publications and digital tools also increased compared to baseline (pre-2.3% to post-21.4%) as did the use of project management elements applied in pharmacy school training (pre-4.6% to post-25%). Additionally, participants conveyed that project management is a growing skill in pharmacy (pre-41.8% to post-53.6%). Conclusions: Project management is a marketable skill
for future pharmacists and foundational to any area of pharmacy practice. While the introduction to project management principles and methodology occurred in an informatics context, it is important for navigating the demands of a professional curriculum and professional practice. The ability to logically organize and prioritize tasks related to a goal is increasingly important in student pharmacist training with direct application to advances in the field of pharmacy.

Scaffolding Assignments to Help Students Learn to Revise DI Responses Using Various Formats
Sherrill J. Brown, University of Montana, Jean Carter, University of Montana.

Objective: Help student practice revision skills to improve their written drug information responses. Methods: Third-year pharmacy students are required to write a response to a drug information (DI) question. The assignment was scaffolded into three parts this year. First, students received a DI question at the beginning of the semester and initially wrote a traditional DI response with detailed summaries of relevant clinical studies, which was submitted after peer review. Second, students completed a two-part verbal response assignment—a short outline of the verbal response and a recording of the verbal response. Finally, the students wrote a second response to the same DI question, which was shorter and focused on pertinent details about the studies. At the end of the semester, students were asked to reflect on their experiences with the drug information response assignments. Results: The majority of the 62 students (77%) felt that the shorter, focused paper would be more useful to clinicians requesting drug information. However, other students liked the detailed, in-depth information provided in the first paper. Almost all (97%) of the students felt that the verbal response assignment helped them revise the written response to focus on the answer to the question. Most students (79%) felt that the shorter response was easier to write, primarily because they had already performed the research and were more familiar with the topic after the multiple assignments. Conclusions: Scaffolding assignments allows students to practice responding to a DI question using various written and verbal response formats. By responding to the same DI question throughout the semester, students could perceive how the formats differed and consider the appropriate use of the formats.

The Blame Game: Exploring Story-Based Learning of Medication Errors and a Culture of Safety
Rebecca Hoover, Idaho State University, Megan Penner, Idaho State University.

Objective: The objective of this study was to determine whether first year versus third year students would assign different levels of fault to various health care professional characters in a fictional scenario where a medication error occurred. Methods: Students analyzed three fictional scenarios containing medication errors. For each scenario they assigned a portion of responsibility for the error ("blame") as a percentage (0 to 100%) for the following characters: pharmacist, pharmacy technician, physician, nurse, and patient. The facilitator advised that for each scenario only those roles could have "blame" and that each scenario should have 100% responsibility for the error divvied as they deemed fit. Results: First and third professional year students assigned a similar proportion of responsibility for the pharmacist character in each of the three scenarios. However, in one scenario, first year student attributed significantly more blame on to the patient. (13% versus 32%; p = .03). Conclusions: Playing a "Blame Game" is a potential mechanism to discuss the human nature of ascribing blame to a person rather than a process. With regard to these scenarios, professional responsibility toward the pharmacist did not change over the curriculum. Pharmacy students should appreciate that while assigning blame may be instinctive, it is the processes, safe guards, and safety gaps rather than individuals that should receive the most attention when analyzing a medication error.

Using Reflection Assignments to Assess Drug Information and Information Literacy Skills
Michael Mannheim, Western New England University.

Objective: Assessment of PHAR 511 has been through objective measures such as exams. The aim is to investigate whether drug information and information literacy skills can be assessed through subjective measures, such as a reflective assignment. Methods: PHAR511: Drug Information and Informatics is a required course in the Doctor of Pharmacy program that incorporates skills in drug information and information literacy. For Fall 2020, instructors added two reflection assignments, one assigned the first week of the semester (Reflection #1) and one due the final week of the semester (Reflection #2). Qualitative research, in the form of a deductive and semantic thematic analysis, was performed on both reflection assignments. Results: Forty-seven different codes were identified based on course objectives and lectures. Codes were sorted into five themes: Media Literacy, Search Strategy, Literature Evaluation, Library Services, and Ethical Use of Sources. Investigators performed thematic analysis on 45 papers for Reflection #1 and 44 for Reflection #2. Media Literacy was the most dominant theme in Reflection #1, with 40% of papers (18/45) focusing on website evaluation research strategy; 29% of
students (13/45) reported preferring Google and 27% (12/45) reported Google Scholar. Search Strategy was the dominant theme of Reflection #2, with 93% (41/44) of students reflecting on experience with PubMed, 77% (34/44) with using MeSH, and 66% (29/44) with drug information databases. Students also reported usage of search tools such as filters (52%, 23/44) and PICO (52%, 23/44). **Conclusions:** Students entered the course aware of the importance of evaluating sources but limited their research to Googling websites. By the end of the course, students reported having replaced this with the use of PubMed and DI databases.

PHARMACEUTICS

**A Student-Driven Laboratory Teaching Model Focusing on Problem-Solving Skills Using Patient Case Studies**

Hemachand Tummala, South Dakota State University, Shea Wilson, South Dakota State University, Madeline Weber, South Dakota State University, Sierrah Schlekeway, South Dakota State University.

**Objective:** The objective of this work is to design and assess a new pharmaceutics laboratory teaching method that encourages students to use critical thinking and problem-solving skills. **Methods:** Pharmacy students (P1-2nd semester) were trained on problem-solving, critical thinking, and innovation using online material and 2hr lecture. The group of students (4-5/group) were given five compounding-pharmacy-based patient care case studies (over 5 weeks) to solve without any formula or direct instructions. Groups were expected to identify the problem, form a plan, execute it, and then assess the outcome. The model used co-operative learning as students were allowed internet resources, local library, discussions with peers, and the instructor to arrive at the solution. Innovation was encouraged. Points were not deducted for a failed product; however, they were earned through active participation and reflections. Students performed surveys and quizzes at the beginning and end of the course to assess their growth in problem-solving and critical thinking skills. **Results:** 74% of students participated in the study. At the end of the training, the majority of the students felt that they have learned to understand the critical component of the problem (76.27%), collect necessary data (81.35%), connect the data to the problem (83.05%), practice critical thinking skills (86.44%), and debate and discuss in groups to arrive at a better decision (91.52%). 79.66% of the students had fun while learning concepts, whereas 16.9% felt frustrated by the exercise. Student's expectations on problem-solving before the start of the laboratory were met by the end of it ($p < .05$). **Conclusions:** This laboratory model encourages students to utilize and improve their critical-thinking and problem-solving skills by promoting active discussions, application of lecture material, and self-reflection.

**A Sustained Release Delivery Platform for Ibuprofen**

Sara Shakhwar, Chicago State University College of Pharmacy, Eric Perales, Chicago State University College of Pharmacy, Abbas Jamaluddin, Chicago State University College of Pharmacy, Ahmed Abu Fayyad, Chicago State University College of Pharmacy.

**Objective:** Ibuprofen is a common NSAID used to reduce fever, relieve pain & inflammation. The objective of the current work was therefore to prepare and characterize a sustained release oral dosage form Ibuprofen using the graft copolymer Soluplus. **Methods:** Solid dispersion mixtures of Ibuprofen were prepared using Soluplus. Soluplus at ratio of 10%, 15% and 40% were used in the current study. Soluplus was first solubilized in acetone to which Ibuprofen was added. The solvent was allowed to evaporate at ambient temperature and further dried in an oven at 40°C for 20 hr. Dissolution for the developed dosage forms was carried out using US type-1 apparatus at 75 rpm for 24 hr in phosphate buffer (pH 7.2). Samples were analyzed for Ibuprofen by HPLC at A max = 264 nm on mobile phase composed of 75% v/v MeOH and 25% v/v of 0.8% H3PO4 at flow rate of 1.5 ml/min. **Results:** 15% Soluplus solid dispersion showed a sustain release profile with 35% release profile for Ibuprofen was demonstrated at 6 hr. Controlled release profile was maintained up to 95% of Ibuprofen were released through 24 hr time window. However, 40% Soluplus solid dispersion demonstrated a retarded release profile with only 35% of Ibuprofen were released after 24 hr. **Conclusions:** In this study a sustained release dosage form for Ibuprofen was prepared. The sustained release profile, however, can only be attained at well-defined Soluplus to Ibuprofen ratio.

**Comparison of In Vitro Permeation of Non-Steroidal Anti-inflammatory Drugs Using Strat-M Membranes**

Brittany J. Bush, Xavier University of Louisiana, Edidiong Utin, Xavier University of Louisiana, Maliah Mayweather, Xavier University of Louisiana, Tommy C. Morris, Xavier University of Louisiana.

**Objective:** Compounded preparations providing pain relief through topically delivered medications are well documented. Non-steroidal Anti-inflammatory Drugs (NSAIDs) used topically provide pain relief while avoiding first-pass metabolism and GI-related issues associated with orally administered NSAIDs. Previous studies have not attempted to directly compare the skin permeability
properties of a group of NSAIDs to conclude which would be preferred in topically applied preparations. The purpose of this study is to evaluate the skin permeation properties of five different NSAIDs compounded as topical creams. **Methods:** To evaluate this, Ketoprofen, Diclofenac Sodium, Indomethacin, Piroxicam, and Celecoxib were compounded as 1% w/w creams in the cream base, Lipoderm. Furthermore, we included Voltaren Gel® (1% diclofenac sodium), a recently approved “over the counter” topical pain product. The in vitro permeability study was performed using a Franz-type vertical diffusion cell system. Strat-M membranes were used as an artificial skin barrier and have been shown to be a great screening tool for this type of work. Samples were collected up to 24 hours and analyzed using a High Performance Liquid Chromatography (HPLC) method. **Results:** Results showed that of the six topical formulations tested, the Ketoprofen formulation has superior skin permeability properties compared to the other NSAIDs in Lipoderm. Voltaren Gel showed similar permeability properties to the Ketoprofen compounded preparation while being clearly superior to the Diclofenac Sodium compounded preparation. Minimal to no permeation from the Indomethacin, Piroxicam, and Celecoxib preparations were observed. **Conclusions:** We conclude that Indomethacin, Piroxicam, and Celecoxib are not ideal NSAIDs to be used in basic compounded formulations intended for topical use. Furthermore, we conclude that Ketoprofen and Diclofenac Sodium have permeability properties that suggest they are preferred NSAIDs used in compounded topical formulations.

**Current Situation and Gap between Teaching and Practice in Pharmaceutical Compounding**

Uyen Le, California Northstate University College of Pharmacy, Sukhpreet Gill, California Northstate University, Bichtien Thach, California Northstate University, Jason Bandy, California Northstate University, Jocelyn Gonzales, California Northstate University.

**Objective:** To analyze the current teaching in pharmaceutical compounding, compare it to the requirements of practice, and provide solutions to any deficiencies that the teaching is facing. **Methods:** We identified different key factors, including standards of practice in current pharmaceutical compounding operations, compounding curricula, gaps between teaching and practice, and finally provided solutions for the gap filling. The USP Compounding Compendium was used as the platform of standard compounding guidelines. Compounding curriculum data was obtained from accredited colleges of pharmacy (COPs). Finally, three different surveys were conducted on CNUCOP APPE preceptors, CNUCOP pharmacy students’ class 2020, and California compounding pharmacies for current compounding practice information. **Results:** The study showed that compounding curricula were included in most of COPs but varied in distribution and load. According to the response from 5 surveyed compounding pharmacies, entry-leveled pharmacists would be expected to comprehend the basis of calculations, USP guidelines (795, 797, and 800), verification of accurate prescription and label, and compounding process. Knowledge on both non-sterile and sterile compounding was highly necessary. Preceptors (80%, n=55) stated that student’ skill in calculations was important besides training on compounding formulation. Interestingly, while ranking APPE students at a high level of competency in calculations (80%), the preceptors had lower ranking in student’s confidence (38%) at this skill. Student’s ranking (n=39) for their confidence and competency in compounding skills is matching with preceptors. The major gap filling is recommended for improved knowledge and skills on compounding, especially sterile compounding. **Conclusions:** We aim to a consistent and standardized teaching program in pharmaceutical compounding for pharmacy students. This will provide a smooth transition from learning into practice, thus alleviating medication errors and ensure high-quality compounded preparations to patients.

**Delivery Platform for ONO-5334: A Potential Therapeutic Agent for COVID-19**

Jovan Perkins, Chicago State University College of Pharmacy, Sara Shakhwar, Chicago State University College of Pharmacy, Eric Perales, Chicago State University College of Pharmacy, Abbas Jamaluddin, Chicago State University College of Pharmacy, Ahmed Abu Fayyad, Chicago State University College of Pharmacy.

**Objective:** Recent study demonstrated that a phase 2 clinically tested small molecule ONO-5334 has a promising activity against SARS-Co-V-2, the causing pathogen for the recent COVID-19 pandemic. The purpose of this work was, therefore, to develop a delivery platform for ONO-5334 using solid dispersion technique and the graft copolymer Soluplus. **Methods:** Solid dispersion mixtures of ONO-5334 and Soluplus were prepared in the ratio of 1:0.5, 1:1 & 1:2, respectively. Both the small molecule ONO-5334 and Soluplus were first solubilized in dichloromethane (DCM) solvent. The solvent was completely evaporated by the aid of nitrogen gas, followed by reconstitution of the drug/polymer film in PBS with pH of 7.4. The dynamic release of ONO-5334 from the dispersion was then monitored by HPLC analysis up to 8 hrs and under stirring at 100 RPM. the HPLC analysis was carried out using 5% ACN in water mobile phase at 230 nm, 1 mL/min flow...
Development and Validation of a Selective HPLC-UV Method for Baclofen Determination in Skin Permeation Experiments

Miranda K. Holman, East Tennessee State University, Ashana Puri, East Tennessee State University.

Objective: Baclofen is administered orally multiple times a day to treat muscle spasticity. A transdermal system for baclofen would sustain its delivery and streamline patient dosing. To evaluate transdermal formulation performance, the development of a sensitive analytical method is needed to quantify the drug during permeation studies excluding any skin interference. The present study aimed at developing and validating such a method for baclofen. Methods: The optimized reverse-phase high-performance liquid chromatography (HPLC) method involved isocratic elution on Kinetex® 5 µm, 100 Aο, 250 X 4.6 mm C18 column using a mobile phase (0.2 M phosphate buffer, pH 4 and methanol: 85:15) at a flow rate of 1 mL/min, column temperature of 40°C, and UV detection at 220 nm. Baclofen standards were prepared in phosphate buffered saline (PBS), pH 7.4, for validation in the range of 0.1 -50 µg/mL. The optimized and validated HPLC method can be used for detection of baclofen in skin permeation experiments.

Effectiveness of Review Sessions on Student Performance on Mock NAPLEX Exam

Monica Trivedi, Marshall B. Ketchum University, Ajoy Koomer, Marshall B. Ketchum University.

Objective: To demonstrate the effectiveness of review sessions on students’ performance on mock Naplex examinations. Methods: The College of Pharmacy has contracted with PassNaplexNow Inc., to prepare student pharmacists as “practice-ready graduates” in preparation to passing the NAPLEX. In addition, to live lectures and videos, all P4 students are required to complete online assessment modules in an open-book format in the vendor platform during APPEs. Students attended a one-week review for a total of 48 contact hours (8 hours per day) over 6 days. At the end of each day students were given an exam administered on the topics covered. Students completed a total of 6 exams over the week. During graduation week, six weeks after the Naplex review session, students took a mock Naplex exam consisting of 80 questions. Results: The mean scores (% correct) from the final exam were compared to six content specific examinations that were taken in the six-day review course. There were 16 topics common, for a total of 64 of the 80 questions in the final and examinations 1 to 6. There was an increase in mean scores for five topical area in the final (Antiarrythmia, CHF, Asthma, Vaccinations, and HIV). Only one topical area, Vaccinations (mean ± SE: 75.43±3.9 versus 66.33±2.8), was deemed statistically significant (p<.05). The student scores decreased in the remaining content areas. Decrease in mean scores were statistically significant (p<.05) in six areas. Conclusions: The study was limited by the small sample size of one P4 cohort, in addition to the exam limited number of topical areas common from the week review versus the final mock exam. Overall, there was still improvement in some of the topics common to both.

Filling in the Gaps on the ISMP Do Not Crush List

Fang Zhao, St. John Fisher College, Elizabeth Uttaro, St. John Fisher College, Anne Schweighardt, St. John Fisher College.

Objective: The ISMP Do Not Crush List is a common resource for healthcare providers to determine whether an oral solid drug product can be manipulated. However, evidence is weak or missing for a number of immediate-release products. An in-depth analysis of these products was performed to remove unnecessary restrictions and provide alternative recommendations. Methods: The ISMP Do Not Crush List was reviewed, and the products in question
were identified if they were listed with “no reason” provided or “film-coated” as the only reason. A checklist of evaluation criteria was then developed and used for analysis, including drug exposure safety, special dosage form designs, physicochemical stability, and pharmacokinetics. Appropriate references and search strategies were streamlined, and manufacturers were contacted with a standard drug information inquiry. **Results**: A total of 20 “film-coated” tablets and 17 “no reason” drug products were identified and evaluated. The analysis revealed that 9 products are softgels or meta-stable formulations which indeed should not be crushed. Most of the remaining 28 products present no or low risks for crushing. Some products may require special handling precautions for safety, timely administration of the crushed powder to patients, or increased monitoring for efficacy and safety. A table summarizing the results along with the conditional recommendations is provided for pharmacists and other healthcare providers to aid in clinical decision making. **Conclusions**: A checklist of evaluation criteria was developed and used to analyze a group of questionable immediate-release products on the ISMP Do Not Crush List. A significant number of these products were found to be suitable for crushing with conditional recommendations. Furthermore, the checklist and evaluation strategy present a framework for pharmacists to assess crushability of any future products.

**Gemcitabine Delivery Platform for Pancreatic Cancer**

Humna Shaikh, **Chicago State University College of Pharmacy**, Yahia Sharbaji, **Chicago State University College of Pharmacy**, Yassin Mawari, **Chicago State University College of Pharmacy**, Sami Malovski, **Chicago State University College of Pharmacy**, Adnan Restum, **Chicago State University College of Pharmacy**, Sami Nazzal, **Texas Tech University Health Sciences Center**, Ahmed Abu Fayyad, **Chicago State University College of Pharmacy**.

**Objective**: The therapeutic response of gemcitabine chemotherapy in pancreatic cancer patients remains poor. Enzymatic deamination of the molecule in the body is a well-validated molecular basis for a such poor response. Therefore, the objective of the current work was to design, synthesize and characterize a delivery platform for gemcitabine to counteract the deamination process and further the therapeutic outcomes of gemcitabine in pancreatic cancer.

**Methods**: Four different lipid conjugates of gemcitabine were synthesized. Gemcitabine was first protected by BOC group, followed by conjugation to α-T, g-T3, stearic and linoleic acids. 1H-NMR & MS analysis were performed to confirm the conjugates. In vitro deamination assay was performed using CDA ELISA kit. The in vitro cytotoxicity of the conjugates was evaluated against BxPC-3 and PANC-1 pancreatic cancer cells. **Results**: Conjugates were characterized by 1H NMR & MS. In-vitro deamination study showed that all gemcitabine conjugates were stable against the deamination reaction with the g-T3 conjugate was the most stable ($p<.05$) when compared to the free gemcitabine. Interestingly, all gemcitabine conjugates showed significant difference in the in-vitro anticancer activity against both Bx-PC-3 and PANC-1 pancreatic cancer cell lines compared to the free gemcitabine, with the g-T3 conjugate was the most active against both cell lines ($p<.05$) compared to the other conjugates. **Conclusions**: When tested for in-vitro enzymatic deamination, all conjugates were less susceptible to inactivation. The g-T3 conjugate was most stable against deamination. This might explain why the g-T3 conjugate was the most potent treatment against both pancreatic cancer cells. It was concluded that conjugation of gemcitabine to the g-T3 isomer is a viable option for gemcitabine delivery for pancreatic cancer and warrants further preclinical development.

**Integrated Pharmaceutical Sciences Laboratory as a Tool to Encourage Innovation**

Hemachand Tummala, **South Dakota State University**, Sierrah Schlekeway, **South Dakota State University**, Madeline Weber, **South Dakota State University**, Shea Wilson, **South Dakota State University**.

**Objective**: The objective is to assess P1 pharmacy students on their knowledge and interest in pharmacy innovation before and after performing laboratory training focused on problem-solving, critical thinking, and innovation. **Methods**: The students were trained on innovative thinking and problem-solving through a 2-hour lecture. The students with groups of 4-5 were given an open-ended patient-care case study each week for 5 weeks, which were focused on compounding pharmacy and require integration of knowledge from various pharmacy courses (pharmaceutics, medicinal chemistry, pathophysiology, and patient counseling). A stress-free environment was provided to encourage risk-taking behavior. The students performed surveys and quizzes pre- and post-laboratory sessions to assess their expectations, experience, understanding of innovation, and confidence in solving real-life patient care problems. **Results**: Around 74% of students participated in the study. Around 83.05% of students felt that they were challenged to be innovative throughout the laboratory, and 74.57% learned to be innovative by the end of the laboratory. Students learned to be innovative on their own (62.71%), with instructor guidance (64.4%), and along with their peers (74.57%). The majority of the student had fun while learning concepts (79.6%) with the minority feeling stress (18.6) in...
this model. Student's expectations on the innovation before the start of the laboratory were met at the end of it (p<.05). The majority of the students felt that they had become active innovative thinking members of their group (84.43%) and developed confidence in solving real-life problems in compounding formulation (74.6%). Conclusions: The laboratory had an overall positive impact on encouraging students to be innovative by promoting out-of-the-box thinking and the application of previously taught material.

Lutein Loaded Biotinylated Polymeric Nanoparticles for the Treatment of Age-related Macular Degeneration

Pradeep Kumar Bolla, The University of Texas at El Paso, Vrinda Gote, University of Missouri-Kansas City, Bradley Clark, High Point University, Sai Hanuman Sagar Boddu, Ajman University, Mahima Singh, University of Sciences at Philadelphia, Jwala Renukunta, High Point University.

Objective: The goal of this study is to enhance the delivery of lutein into retinal cells using PLGA-PEG-Biotin nanoparticles to treat Age related macular degeneration (AMD) Methods: Lutein loaded polymeric nanoparticles were prepared using O/W solvent-evaporation method. Particle size and zeta potential (ZP) were determined using Malvern Zetasizer. Other characterization included differential scanning calorimetry, FTIR, and in-vitro release studies. In-vitro uptake and cytotoxicity studies were conducted in ARPE-19 cells using flow cytometry and confocal microscopy. Results: Lutein was successfully encapsulated into PLGA and PLGA–PEG–biotin nanoparticles. Sizes of lutein-loaded PLGA and PLGA–PEG–biotin nanoparticles were 196.4 ± 20.04 nm and 208.0 ± 3.38 nm, respectively. The entrapment efficiency of lutein was 56% and 75% for lutein-loaded PLGA and PLGA–PEG–biotin nanoparticles, respectively. FTIR and DSC confirmed encapsulation of lutein into nanoparticles. Cellular uptake studies in ARPE-19 cells using flow cytometry (FACS) and confocal microscopy confirmed a higher uptake of lutein with PLGA–PEG–biotin nanoparticles compared to PLGA nanoparticles and lutein alone. In vitro cytotoxicity results confirmed that the nanoparticles were safe, effective, and non-toxic. Conclusions: We have successfully developed and characterized lutein-loaded, biotin-decorated polymeric nanoparticles. Results from this study suggest that biotin-conjugated nanoparticles may be an appropriate formulation for targeted drug delivery in the treatment of AMD and other retinal diseases.

Shelf-life Stability of Expired Tamiflu

Keith DelMonte, St. John Fisher College, Todd Camenisch, St. John Fisher College, Fang Zhao, St. John Fisher College.

Objective: The strategic national stockpile (SNS), is a mechanism for the federal government to prepare for disasters that would require mass dispensing of drugs. The antiviral, Tamiflu, is a drug in the SNS and state stockpiles that have mostly expired and it is unknown if these reserves are pharmaceutically active. This jeopardizes public health during influenza pandemic. Stockpiled medications should be replaced on a regular basis, accruing significant cost and waste. As a result, the Federal Government established the shelf life extension program (SLEP) to permit usage of expired federal stockpile medications during times of national disasters. Several expired lots of Tamiflu are stored in a secure facility by the county Department of Public Health. County stockpiles are not under federally mandated stockpile guidelines, nor does SLEP provide guidance on shelf life extension of these local reserves. This study evaluated the quality of several Tamiflu stocks stored in the county stockpile. Methods: USP method for oseltamivir phosphate was used to measure drug potency of stockpiled Tamiflu. Practical modifications to the USP dissolution method were used to evaluate the drug release of samples. Results: Chemical stability of three lots of expired Tamiflu indicated satisfactory drug potency with all lots meeting the USP acceptance criteria of the labeled claim. Dissolution testing showed that all three Tamiflu lots passed the criteria of no less than 75% of labeled amount of drug dissolved. All samples analyzed had approximately 100% dissolution and chemical release attributes comparable to controls. Conclusions: All expired lots of stockpiled Tamiflu tested were stable and potent based on USP guidelines.

The Perceived Effect an Active Learning Classroom has on Student Engagement and Learning

Kim Hancock, Ferris State University, Gregg Cothern, Steelcase, Aileen Strickland, Steelcase, Yvette Iyiguhaye, Steelcase, Alexis Adaschick, Steelcase.

Objective: Determine if perceived pharmacy student (P1) engagement and learning are improved when students learn in an active learning classroom vs a traditional classroom. Methods: The first 6 weeks of the semester P1 students (120) attended two courses (Dosage Forms and Biopharmaceutics Pharmacy and Healthcare Systems 1) in a traditional table and chair classroom. At the end of the six weeks the students were asked to complete the Steelcase Learning Environment Evaluation Before Active Learning Survey (100). The next 9 weeks of the semester the same students attended the same two courses in a remodeled active learning classroom. At the end of the 9 weeks the students were asked to complete the Steelcase Learning Environment After Active Learning Survey (101). Both surveys have been validated by Steelcase and are used to evaluate behaviors and perceptions
related to engagement and student success. Classroom instruction was not modified, both instructors continued to teach using the same methods but in different classroom spaces. **Results:** More students in the active learning classroom reported that the classroom had a positive or very positive effect on the following: Be more creative - 29% traditional, 66% active learning (129% increase); communicate work/ideas - 42% traditional, 88% active learning (110% increase); Facilitate problem solving - 34% traditional, 71% active learning (110% increase); connect with others - 43% traditional, 87% active learning (103% increase); collaborate with classmates - 48% traditional, 87% active learning (82% increase). **Conclusions:** The classroom designed for active learning had a significant impact on perceived student engagement and learning and can potentially promote the development of soft skills.

### The Use of Dimensional Analysis, Ratio and Proportion, and Equations to Solve Pharmacy Calculations Problems

Eytan A. Klausner, *South College School of Pharmacy*, Matthew J. Holt, *South College School of Pharmacy*.

**Objective:** To evaluate the effects of use of different problem-solving approaches on the success rates of student pharmacists in solving problems throughout a pharmacy calculations course. **Methods:** A survey instrument was administered to first-year students (*n=*96, response rate=100%) near the completion of a pharmacy calculations course. The survey assessed which problem-solving approaches students experienced prior to matriculation into the PharmD program; and whether they used the approaches of ratio and proportion or equations, versus dimensional analysis to solve calculation problems involving conversions, weight-based doses, flow rates, electrolyte solutions, and expressions of concentration. Questions used as part of course exams were tagged according to themes. Mean success rates in solving tagged questions were correlated with the problem-solving approach that students used. **Results:** The success rates of students in solving conversions were 74% ± 24% for ratio and proportion, 84% ± 14% for dimensional analysis, and 91% ± 12% for the use of both approaches equally. Success rates in solving calculation problems of weight-based doses, flow rates, electrolyte solutions, and expressions of concentration were similar for various approaches. **Conclusions:** The use of dimensional analysis, or the combination of ratio and proportion and dimensional analysis equally, may be advantageous for the solution of conversions but not for other types of calculation problems that were studied. Since students chose to use dimensional analysis, ratio and proportion, and equations as needed to solve calculation problems, it would be beneficial for pharmacy calculations instructors to demonstrate multiple problem-solving approaches when teaching students different course themes.

### PHARMACY PRACTICE

**A Co-Curricular P4 Residency Preparation Series to Increase Regional Campus Match Rates**


**Objective:** To assess the impact of a P4 regional co-curricular residency preparation series on student match rates. **Methods:** An eight-session series consisting of approximately 1-hour meetings each month was designed from May 2019 to March 2020. Students were provided with an initial residency overview session at the end of P3 year and encouraged to attend future sessions during P4 year if interested in pursuing residency. Sessions consisted of informational sessions focused on: choosing programs, interview skills, letters of intent, navigating a showcase, CV review, and an overview of The Match/Phase II process. The sessions were led by faculty, but largely driven by student discussion and active learning. An additional session was also provided for individual assistance to students participating in Phase II. Residency preparation materials provided to students were derived from ASHP and ACCP websites, along with other online resources. **Results:** Six of the 16 (38%) regional students participated in the residency preparation series. Overall, 3 of the 6 (50%) students matched during Phase I, all of which matched in their top 2 spots. The match rates increased significantly from previous years in the region of 0% (4 applicants) in 2019 and 0% (1 applicant) in 2018. On average, students attended 5 out of 8 sessions, with the most attended sessions being interview skills and how to choose programs when applying. **Conclusions:** A P4 co-curricular residency preparation series can be beneficial in increasing match rates for regional campus students. Regional sites should consider offering sessions to help guide students in the preparation and application process of residency.

### A Longitudinal Evaluation of Student Self-Reported Levels of Entrustability in Performing EPAs


**Objective:** The objective of this abstract is: 1) to describe the use of EPAs as a tool to guide student learning in a 3-trimester course series (Healthcare Delivery (HCD)) and; 2) to evaluate students self-reported levels of entrustability in performing EPAs as they progress through such
a course. Methods: P2 students enrolled in the HCD course series at Chapman University were introduced to EPAs as a tool to guide their learning of professional pharmacist activities and asked to self-report levels of entrustability in performing 59 supporting tasks across 6 EPA domains via Qualtrics at the start of every trimester. Results were aggregated into descriptive summaries and compared longitudinally across 3 trimesters. Responses were stratified by class year (eg class of 2018-2020). Categorical variables were reported in percentages. Results: 538 responses were collected over 3 years. At baseline (start of HCD course series), the majority of students self-reported either no experience, or levels of entrustability at the direct or reactive supervisory level for the majority of tasks. An increasing number of students self-reported levels of entrustability at the reactive, intermediate, and general direction supervisory levels as the course series progressed. Surprisingly, several students every year reported levels of entrustability at the mastery level. Conclusions: Student self-reported levels of entrustability increased as they had more exposure to performing professional activities in different care settings even in a simulated environment. EPAs as a tool to guide learning of pharmacist professional activities can be useful in the pharmacy curriculum. However, there may be misunderstanding of what is required to be at a mastery level by students who have falsely high levels of confidence and this needs to be highlighted.

A Qualitative Study Examining Student Perceptions of Online Pharmacy Skills Laboratory Experiences

Kevin T. Fuji, Creighton University, Kimberley J. Begley, Creighton University, Eric Hoie, Creighton University, Julie Stading, Creighton University.

Objective: The COVID-19 pandemic forced many pharmacy programs to convert in-person instruction to the online environment, including traditional hands-on, skills-based laboratory courses. The objective of this study was to understand students’ perceptions of in-person pharmacy skills laboratory courses converted to an online format. Methods: The Creighton University Doctor of Pharmacy (Pharm.D.) program offers a distance pathway which requires students to be on-campus for pharmacy skills laboratory courses in the summer after their first three years in the program. Due to the COVID-19 pandemic, the 2020 summer lab courses were converted to an online format. At the end of each course, an anonymous, voluntary online survey was completed by students, comprised of four open-ended questions about their overall experience, how their learning was facilitated or hindered by the online environment, and any other comments. A qualitative content analysis was used to analyze all student responses. In vivo and open coding were used, followed by aggregation of codes into major categories, and formation of themes describing relationships between major categories. Themes were compared across each course. Results: Sixty-four first-year, 75 second-year, and 30 third-year students completed surveys. Themes were similar across courses: a) overall experience was similar to being in-person; b) saves time and money; c) cannot replace hands-on skills (eg, blood pressure monitoring); d) limits professional relationships with peers and faculty; e) barrier to real-time questions and feedback; and f) technical difficulties. Conclusions: While online pharmacy skills laboratory courses are feasible and generally well-received by students, it is important to consider both the benefits and drawbacks of such an approach. Future research should examine impact on long-term retention of learning and performance on Advanced Pharmacy Practice Experiences (APPEs).

A Virtual Escape Room and Simulation as a Method to Improve Interprofessional Socialization

Nicholas M. Fusco, University at Buffalo, The State University of New York, Kelly Foltz-Ramos, University at Buffalo, The State University of New York, Patricia Ohtake, University at Buffalo, The State University of New York.

Objective: To compare the change in nursing, pharmacy and physical therapy students’ interprofessional (IP) socialization and readiness to function in IP teams after participation in a virtual IP activity. Methods: IP teams of nursing (n=93), pharmacy (n=75) and physical therapy (n=33) students participated in this learning experience comprised of online learning, and a virtual escape room, followed by a virtual simulated case conference. The learning experience themes were sepsis and joint precautions following hip replacement surgery. In the case conference, students collaboratively developed an IP discharge care plan for an individual leaving the hospital after a hip replacement complicated by post-operative sepsis. Before and after the learning experience, students completed a knowledge test and a validated pre and a post survey that assessed their IP socialization and knowledge (Interprofessional Socialization and Valuing Scale-21). At post, students completed a program evaluation. Results: Participation in these learning experiences increased IP socialization (5.5±0.9 vs. 6.0±0.9; p<.05) among all students with a medium effect size (Cohen’s d = 0.56). There were no changes in scores on knowledge assessment (6.6±1.6 vs. 6.7±1.6; p=.85). The program evaluation revealed students highly valued this learning experience as being both effective and important to their professional development. Conclusions: A virtual IP escape room and simulated case conference positively influenced students’ interprofessional socialization and readiness to function in IP teams. The students
valued the experience and realized its importance in their development as student health professionals. The virtual environment provided flexibility with scheduling and alleviated concerns with physical distancing in classroom spaces.

**Academic Outcomes of a Two-Week ‘Soft Skills’ and Self-Study Modules Program in Pharmacy School**

Vista Khosraviani, Touro University California, Eric Ip, Touro University California, Shadi Doroudgar, Touro University California.

**Objective:** To assess the impact of adding a ‘Soft Skills’ and Self-Study Modules program in the P1 first-semester academic performance. **Methods:** This pre/post-intervention study was conducted at TUC-COP using first-year pharmacy school data from the Class of 2022 and Class of 2023. The change in curriculum design took place starting Fall 2019. As such, academic performance from the Fall semesters 2018 and 2019, for the Class of 2022 and 2023 respectively, were compared in a retrospective manner. Student performance was evaluated based on grades earned on specific lecture exam questions in which both classes were taught. Baseline demographics and academic characteristics (The Pharmacy College Admission Test (PCAT), GPAs, 4-year university degree, etc.) were collected for students accepted into both classes. Demographic and academic characteristics were extracted from The Pharmacy College Application Service (PharmCAS) Applicant Data Report. These data points were analyzed to determine predictors for academic performance in Fall P1 year. Individuals were excluded if they repeated at least one P1 course or took a leave of absence. All statistical analyses will be conducted using STATA IC Version 14.0. **Results:** Class of 2023 (n=70), which was affected by the TUC-COP curriculum change, overall scored higher on the 41 lectures analyzed in this study 82.4% vs. Class of 2022 (n=81) 79.3%. This result was found to be statistically significant, p-value 0.021. **Conclusions:** The implemented curriculum revision at TUC-COP could be a contributing factor in improving student’s foundational knowledge as shown by Class of 2023 displaying higher cumulative academic performance in comparison to Class of 2022. Future studies should investigate the long-term effect of curriculum revision advised by ACPE Standards 2016 on the academic performance of Doctor of Pharmacy students.

**Activity Days: A Model for Incorporating Interprofessional Education**

Paige D. Brown, Campbell University, Victoria Kaprielian, Campbell University, Marisa Vaskalis, Campbell University.

**Objective:** Campbell University has successfully used a model of IPE Activity Days to bring together health professions students from more than 7 health professions programs over the past three years. Activities are developed and facilitated by faculty and/or upper-class students from all health science programs on a volunteer basis. This low-cost model is versatile and useful to other institutions facing the challenges of incorporating IPE programming into their curricula. **Methods:** Annually, a call is sent out to faculty and students for activity proposals, which are submitted via an online form. This form asks prospective presenters to substantiate that their proposed activities meet a list of requirements for IPE activities. Once received, the office reviews the proposed activities to ensure that all requirements are met for quality IPE programming. Then, the proposed activity is verified and added to the Activity Roster. Students select the activities they wish to attend and submit their preferences. The IPE Office then assigns activities to students based on their preferences, the interprofessionality of each session, and other logistical factors. **Results:** On the day of the event, an average of 50 sessions are held over a 3-hour period. Approximately 240 students attend sessions in each of the 1-hour schedule slots. A list of activity examples is provided on the poster. Student feedback indicates that overall satisfaction is high (most recently, a rating of 4.2 out of 5). **Conclusions:** Students who attend these half-day events belong to multiple highly compressed health professions curricula. The nature of the events allows them to choose from a wide variety of interprofessional activities to learn with, from, and about each other.

**Adaptation of an Interprofessional Vaccine Administration Course to COVID-19 Restrictions**

Ann M. Philbrick, University of Minnesota College of Pharmacy, Robin Austin, University of Minnesota School of Nursing.

**Objective:** To describe the adjustments made to an interprofessional vaccine administration course to meet general infectious disease restrictions established by college, local, state, and national guidance. **Methods:** This interprofessional course with nursing and pharmacy students, and has existed for approximately 20 years. Course directors work with this institution’s student health clinic to provide influenza vaccine at some mass vaccination clinics on campus. Owning to COVID-19, several adjustments had to be made to this hands-on course. All in-person coursework was transitioned to a hybrid of online asynchronous and live content with discussions used for the interprofessional interaction component. The live practicum component was adjusted to comply with physical distancing rules. Finally, the vaccine clinics were adjusted so that they took
place in a fixed location and students signed up for a full day shift. At the conclusion of this course, students were surveyed regarding these changes. Results: A total of 58 students (29 from each profession) were enrolled in the course, with 37 students (16 nursing, 21 pharmacy; 64% response rate) responding to the survey. Overall the course was well-received, with most students responding positively to the changes. Most students (54%) felt that the interprofessional experience was ‘not enough’. While all students agreed or strongly agreed that the coursework adequately prepared them for the clinical experience, 75% of students also agreed or strongly agreed that more in-person experiences were needed to learn more about their interprofessional counterpart. Conclusions: Adjusting this course to comply with COVID-19 restrictions was largely a success, with interprofessional education being one area that could have been strengthened. Lessons learned during this offering will help adjust future offerings when COVID-19 precautions are lifted.

Addressing Suicide Prevention Techniques Within a P3 Pharmacy-Skills Course: An Alternative Approach to MHFA Training

Talisa Marchese, D’Youville College, Rebecca Waite, D’Youville College.

Objective: To determine if the delivery of a single three-hour interactive training session addressing the role of student pharmacists in suicide prevention will be effective in improving their confidence levels in approaching these issues. Methods: A three-hour suicide prevention training session was developed for third-year student pharmacists as part of their pharmacy skills practicum. The session was held in a virtual format. Polleverywhere was used within the session to administer anonymous, voluntary audience-response surveys for pre-class and post-class perceptions and to provide recommendations for the pharmacist involved in two patient case-based scenarios. Before and after of the session, students rated their comfort level with discussing the topic of suicide using a 5-point Likert scale, and they identified the cohorts with whom they would feel comfortable interacting if suicidal thoughts are suspected or known. All responses were collected and displayed in real-time to prompt class discussion and provide instant feedback. Results: Fifty-four students participated in the training. Five (9.3%) students had previously completed Mental Health First Aid training. Compared to pre-class surveys, student comfort levels surrounding conversations about the topic of suicide increased by the end of the session. The number of cohorts of suicidal persons with whom the students felt comfortable interacting expanded over the course of the session. Within the case discussions, students were able to accurately identify risk factors, provide appropriate responses to patient statements about their suicidal thoughts, and recommend local and national resources for patients. Conclusions: A three-hour interactive training session designed specifically toward student pharmacists can be an effective alternative to improve student confidence with suicide prevention techniques when Mental Health First Aid training is not a viable option.

Advancing Student Pharmacist Thinking and Decision-Making Skills in a Multi-Campus Infectious Diseases Elective

Sharmon P. Osae, The University of Georgia, Daniel Chastain, The University of Georgia.

Objective: Does participation in a multi-campus 2-credit-hour applied infectious diseases (ID) pharmacotherapy elective lead to increased perceptions of clinical decision-making skills and associated confidence in third-year student pharmacists? Methods: An electronic survey was distributed before and after completion of the course. Perceptions of skill acquisition and confidence were assessed using specific ID competencies derived from previous literature and course objectives via a modified Dreyfus model. Participation was voluntary and responses were de-identified. Descriptive statistics and Student's t-tests were utilized with statistical significance if calculated p values were < 0.05. Results: Thirteen students enrolled in the elective and 100% completed both surveys. Self-reported experience with ID pharmacotherapy varied from a moderate amount (n = 2, 15%) to a little/none (n = 11, 85%). All reported motivation to gain a better understanding about ID basics and improve clinical decision-making skills, and 62% (n = 8) sought to improve their ability to critically evaluate literature. All reported improvement in clinical decision-making skills, of which 92% (n = 12) noted a better understanding about ID basics and an improved ability to critically evaluate literature. There was a significant increase in perceived confidence in microbiology, patient specific treatment, and using resources, whereas perceptions of confidence decreased regarding drug specifics. Post-course, nine students intended on pursuing residency/fellowship and all were interested in pursuing an ID career. Conclusions: Participation in a multi-campus applied ID pharmacotherapy elective increased perceived clinical decision-making skills and confidence related to microbiology, patient specific, and use of resources domains associated with the course. Students may have been overconfident in their perceptions associated with drug specifics and post-course reported decreased confidence in this area. Overall, all reported a better
understanding about ID basics and an improved ability to critically evaluate literature.

An Integrated Approach to Learning the Foundational Sciences as a Basis for Clinical Reasoning

Catherine Rebitch, University of Pittsburgh, Prema Iyer, University of Pittsburgh, Matthew Grubic, University of Pittsburgh, Lawrence Kobulinsky, University of Pittsburgh School of Pharmacy, Matthew Freidhoff, University of Pittsburgh.

Objective: The primary objectives of this project were to show relevance and application of foundational science knowledge to pharmacy practice, and to promote student engagement using active learning methods. Methods: A collaborative group of faculty, staff and students created an integrated activity tying concepts from biochemistry, a foundational science, and “top drugs” content in a pharmaceutical care course. Diabetes was chosen as a disease state in which students could apply knowledge from both courses. The activity was deployed using the Qualtrics platform and included embedded videos and scenarios. 118 first-year pharmacy students completed the activity in November 2020. Upon completion of the activity, students were asked to respond to an anonymous survey about their experience. Results: The majority of students surveyed (85%) indicated they “totally agreed” that the activity helped them to see how the content was interrelated. 58% of students “totally agreed” and 37% of students “somewhat agreed” that the activity was engaging. 60% of students “totally agreed” and 34% of students “somewhat agreed” that this interactive teaching method should be further incorporated into the curriculum. Open-ended feedback supported these results. Conclusions: The integrated activity helped students to bridge concepts learned in biochemistry to pharmaceutical care. Pilot data assessing student perceptions of the learning activity was overall positive and provides support for future integration into the curriculum. Faculty within other health science disciplines, and at other schools of pharmacy, may be interested in adopting interacting modules to integrate content.

APPE in the Time of COVID-19: An Internal Medicine Rotation Gone Virtual

Stephanie L. Sibicky, Northeastern University, Alexa A. Carlson, Northeastern University.

Objective: To describe the delivery and assessment of a virtual internal medicine advanced pharmacy practice experience (APPE) due to mandatory stay-at-home orders caused by the coronavirus pandemic. Methods: In the absence of face-to-face patient care and access to electronic medical records (EMRs), two faculty utilized existing mock EMRs from another course to simulate patient care activities for eight students. Weekly mini-topic discussions, drug information vlogs, career talks, and a simulated medication reconciliation/discharge counseling session were added to typical APPE assignments including Facebook engagement, blogging, and completing formal topic discussions, journal clubs, and patient presentations. All encounters occurred via video conferencing. Faculty evaluations and student satisfaction survey responses were analyzed. Results: Faculty evaluations were overwhelmingly positive; preceptor #1 scored 3.75-4/4 and preceptor #2 scored 4/4 in all areas. Students commented that despite limited interactions with a medical team, they were challenged, supported, and engaged. Descriptive survey results indicated an overall satisfaction with their experience (mean 8.09, scale 0-10, 10 being most satisfied) and the extremely good quality of activities (mean 8.27, scale 0-10, 10 being highest quality). Free text comments stated the rotation was “well-rounded” and that they “barely felt being virtual was a disadvantage”. One student wrote “It was clear to me the amount of effort… put into creating a positive learning environment and ensuring we were able to experience everything we could in this online APPE.” Conclusions: Using readily available and free technologies, a virtual APPE was delivered with additional learning activities including simulations. While significant planning was necessary, these activities and assignments can be implemented by those needing to offer virtual rotations. Students indicated activities were of extremely good quality and an overall satisfaction with the virtual APPE.

Applying the PPCP to Reinforce Infectious Disease Topics through Point-of-Care Testing, Patient Cases and Telehealth

Ashleigh L. Barrickman, West Virginia University, Katherine Purnell, West Virginia University, Ashlee McMillan, West Virginia University, Lena Maynor, West Virginia University.

Objective: To develop and evaluate two simulated lab activities, which emphasized the use of the Pharmacists’ Patient Care Process (PPCP), infectious diseases (ID), point-of-care (POC) testing and telehealth counseling. Methods: Two new practicum sessions were developed to reinforce the PPCP through POC testing, ID cases and patient counseling sessions to third-year pharmacy students. Counseling sessions were implemented in a telehealth format where students recommended a treatment plan including OTC recommendations based on a given ID POC test result. Anonymous pre- and post-surveys were administered.
Assessing Pharmacy Students Self-Regulation Skills in a Virtual Learning Environment

Suzanne M. Galal, University of the Pacific, Deepti Vyas, University of the Pacific, Martha Ndungo, University of the Pacific, Tim Wu, New York University- Shanghai, Mason Webber, University of the Pacific.

Objective: The virtual learning environment lends itself to challenges for those students lacking in self-regulation skills. The objective of this pilot study was to determine how the Motivated Strategies for Learning Questionnaire (MSLQ) can be used as a predictive tool in the evaluation of self-regulation skills within pharmacy students. Methods: Students enrolled in a required endocrine therapeutics course were included in this study. Data was collected within the diabetes module that took place over 6-weeks. Students were provided with weekly asynchronous optional self-directed learning activities including; pre-assessment knowledge checks, recorded mini-lecture segments, practice case studies and wrap-up reflection questions. Data was collected on student submission and on-time submission rates and self-reported weekly study time. Students completed the MSLQ at the beginning and end of the course. Students also completed the State-Trait Anxiety Inventory (STAI) prior to their exam to measure their test anxiety. Students exam performance at the completion of the module was also collected. Data was evaluated using various correlation analyses to determine the predictive ability of the MSLQ and its 5 subscales.

Results: Seventy-three (90.1%), 79 (97.5%), and 65 (80.2%) students completed the pre-survey, post-survey, and telehealth surveys, respectively. Responses showed statistically significant increases in confidence for all survey items. The post-survey showed strong or moderate correlations between the comfort level for administering an ID POC test and comfort level recommending appropriate treatment based on the results of the same ID POC test. The telehealth survey showed a strong correlation between comfort levels for recommending and educating on appropriate treatment, answering patient questions, and recommending appropriate OTC products for symptoms; however, there was no correlation between comfort levels providing patient counseling and students’ perceived use of the PPCP.

Conclusions: This study indicates that student confidence and knowledge improved as a result of these ID POC lab activities, but also indicates that additional training may be necessary to ensure that pharmacy students can effectively use the PPCP to provide appropriate patient care.
longitudinal approaches. Early introduction of health literacy and health disparities content and reflective practitioner activities is one way to prepare future health professionals in this critical area of practice.

Classification and Value of Faculty Scholarship Among Accredited Schools of Pharmacy

Scott Bolesa, Wilkes University, Jonathan Little, Wilkes University, Luke Minnich, Wilkes University, Dana Manning, Wilkes University, Adam VanWert, Wilkes University.

Objective: Scholarship is a requirement of faculty with academic appointments, yet reports are lacking regarding its classification and value across the academy. Our objective was to determine classification (ie, ranking of scholarship) and value (eg, major versus minor work) of faculty scholarship across ACPE accredited programs. Our central hypothesis was that the classification and value of faculty scholarship is inconsistent among programs. Methods: A 29-question, non-validated, voluntary survey that was developed by tenured faculty members (two clinical and one pharmaceutical science) was electronically distributed (SurveyMonkey; San Mateo, California) to all department chairs of ACPE accredited schools of pharmacy (406 total). Contact information was obtained from an AACP mailing list and school websites. Microsoft Excel was used to perform descriptive statistics and identify data trends. Results: The response rate was 16.3% (66 respondents). The average class size of respondent programs was 104 students with 51.5% of programs being over 50 years old. On average, departments had 23 full-time faculty and 1 part-time, with an average of 48% of full-time faculty tenured or on a tenure track. Departments had 4 full, 6 associate and 1 clinical professor on average. Among respondents 30.3% indicated they utilize classification ranks for faculty scholarship, with 61.5% indicating they utilize an approved departmental classification policy. In addition, 67.5% of respondents place value on faculty scholarship, with 38.5% utilizing a formal policy to assign relative value. Conclusions: The results suggest inconsistency in the classification and value of faculty scholarship among schools of pharmacy. A minority of departments have a classification system for faculty scholarship. A majority utilize a formal classification policy. While most place value on scholarship, the minority use a formal relative value policy.

Combining Simulated Academic Detailing with Naloxone Training for Opioid Risk Mitigation

Rachel S. Kavanaugh, Medical College of Wisconsin, McKenzie Yerks, Medical College of Wisconsin, Ryan Feldman, Medical College of Wisconsin, Matt Stanton, Medical College of Wisconsin.

Objective: Academic detailing (AD) is an educational outreach intervention designed to provide clinicians with current evidenced-based education to improve patient care and is effective in mitigating opioid risks. Most states now have a standing order for prescribed naloxone. While many schools of pharmacy offer either naloxone or AD training, none were found to offer both training for use with opioid mitigation strategies. Student pharmacists’ ability to apply naloxone training may benefit from concomitant AD training by highlighting skills needed to effectively assess patient and provider needs and handle objections in a non-biased, evidence-supported manner while reinforcing the application of naloxone dispensing and administration under the statewide standing order. Methods: Students in an accelerated pharmacy program applied their AD skills during pharmaceutical skills laboratory activities, emphasizing the use of naloxone administration under the standing order. Students then demonstrated their ability to conduct an AD encounter with a simulated community pharmacist and demonstrate their skills in administering naloxone to a “patient” who experienced an emergency after opioid use. Results: The combination of simulated AD with naloxone administration training was designed as a unique opportunity to foster naloxone education and enhance student understanding and demonstration of naloxone administration. Students were successful in conducting an effective AD encounter and in performing appropriate rescue activities for patient experiencing an opioid emergency. Conclusions: School of pharmacy programs should recognize the opportunity to combine hands-on naloxone training activities with AD to prepare students for application of statewide naloxone standing orders.

Communicating Definitive Uncertainty: Teaching Students to Say “I Don’t Know” Using a Simulated Provider Encounter

Courtney L. Bradley, High Point University, Shaina Musco, High Point University, Julie Cooper, High Point University.

Objective: Pharmacists are participants in the complex, adaptive healthcare system which requires management of uncertainty. Low comfort with uncertainty has been associated with negative clinical outcomes. Currently, there are no established best practices for recognizing uncertainty, improving uncertainty tolerance, or optimizing uncertainty communication. The objective of this study was to evaluate the comparative efficacy of two pedagogies in a clinical skills laboratory simulated provider encounter as a method for recognition and communication of factual uncertainty in
Comparison of Student Performance and Perceptions on a Virtual OSCE to In-Person OSCE
Kristine A. Parbuoni, University of Maryland, Deanna Tran, University of Maryland, Amy Ives, University of Maryland.

Objective: OSCEs in 2020 were conducted virtually for pharmacy students, however the effectiveness of virtual OSCEs to assess skills is unknown. The objectives of this study were to compare the communication and clinical skills in a virtual OSCE to an in-person OSCE. Student perceptions of the realistic nature of the OSCEs were also assessed.

Methods: OSCE scores of those who completed the in-person OSCEs in 2019 were compared to those who completed the OSCEs virtually in 2020. Clinical skills were assessed by standardized participants based on the case analytical checklist. Communication skills were assessed utilizing the Global Impression Scale (GIS). Students documented a self-assessment of the GIS and assessed the realistic nature of the OSCE. Scores on the clinical checklists, the GIS, and realistic nature were compared between groups.

Results: 152 students completed the in-person OSCE in 2019 and 138 students completed the virtual OSCE in 2020. For Case A, the average clinical checklist score for 2019 (83.68%) was similar to the score in 2020 (83.38%). The average GIS score was also similar between groups (2.645 vs 2.656). There was no difference in agreement for the question “I felt this OSCE case was realistic” between 2019 and 2020 (97% and 97%). For case B, the average GIS score was similar in 2019 and 2020 (2.457 vs. 2.518), however the average case score was different (69.52% vs. 70.5 to 81.0, p = <.0001) and the virtual written case (73.5 to 85.0, p = <.0001) significantly increased student’s self-rated confidence to verbalize “I don’t know” to a healthcare provider. No significant differences were observed between the two pedagogies. However, students who participated in the virtual written case mentioned a desire for “additional practice opportunities” more frequently in the qualitative assessment than students who participated in the in-person standardized client.

Conclusions: An in-person standardized client and virtual written case both increased pharmacy student comfort with communicating definitive uncertainty through “I don’t know” statements. Further research is needed to instruct student pharmacists in uncertainty communication.


Comparison of Immunization Knowledge Retention Following a One-Day Course or a Five-Week Module
Laura Frankart, Virginia Commonwealth University, Julie Patterson, Virginia Commonwealth University, Alexis N. Crawford, Virginia Commonwealth University, Krista L. Donohoe, Virginia Commonwealth University, Sharon Gatewood, Virginia Commonwealth University.

Objective: The primary study objective was to determine whether there was a difference in student pharmacists’ immunization knowledge retention when content was delivered as a 10-hour course taught over one day compared to over five weeks. A secondary objective was to determine the impact of student pharmacist immunization experience on knowledge retention.

Methods: The APhA Pharmacy-Based Immunization Delivery Certificate Program was used as the content for a one-day program delivered to third-year students and a five-week course taught to second-year students. About eight months later, 45 questions taken from the final exam of the certificate program were administered to both cohorts as a closed-note assessment along with a survey to gather student pharmacists’ immunization experience. Bivariate statistics were used to assess differences in scores, retention, GPA, and immunization-related experience across second- and third-year student pharmacists. Multivariable regression analysis was used to analyze the association between content delivery and retention, controlling for GPA and immunization experience.

Results: A total of 128 second-year and 61 third-year student pharmacists completed both assessments. The average decrease in scores was 26.3 percentage points which was similar for both cohorts. No statistically significant difference was found in knowledge retention based on the course delivery method. However, experience with directly immunizing over 50 patients significantly increased retention compared to student pharmacists who reported never participating in immunization activities.

Conclusions: The method of course delivery, 10-hour one-day course or five-week module, did not affect immunization knowledge retention about eight months later. Student pharmacists who participated in immunization administration to more than 50 patients did show significantly higher knowledge retention. This demonstrates the importance of using knowledge in practical settings, repeatedly, to enhance long-term knowledge retention.
Objective: To describe a new differential diagnosis (DDx) activity added to a general medicine elective. Methods: There is growing interest in pharmacy education to develop training surrounding DDx based on the evolution of the role of the pharmacist. Starting in spring 2020, a lecture focused on applying DDx to a patient case scenario was incorporated into a medicine elective. Students were broken into groups, each of which was responsible completing a standardized chart assisting in the development of a differential diagnosis for common medicine patient presentations including chest pain, lower extremity edema, and shortness of breath. This framework included potential causes, diagnostic criteria, the role of medications, and the role of the pharmacist. The class then applied the concepts to a series of patient case vignettes. Students were given a survey before and after the class ranking their comfort on a five-point Likert scale from strongly agree (1) to strongly disagree (5) for ten statements and free text prompts which were compared to demonstrate growth. Results: Students’ comfort improved in all ten areas (pre-survey average 2.48, post-survey average 1.61). The spring 2021 cohort had higher baseline scores and demonstrated larger changes in average response scores. The statements with the largest changes included defining DDx, recognizing “can’t miss” diagnoses, and being able to contribute to a DDx (mean improvements of 1.78, 1.55, and 1.27, respectively). Common themes from the post-survey included that students learned the definition of a DDx and the importance of having the right resources for performing a DDx. Conclusions: The activity increased student’s comfort with DDx. Students enjoyed the DDx activity, and faculty plan to expand its use in other course areas as appropriate.

Description and Evaluation of a Jigsaw Journal Club Activity in an Advanced Diabetes Elective
Margaret A. Miklich, Temple University, Anisha Grover, Temple University, Michael Barros, Temple University.
Objective: To describe the design of a Jigsaw Journal Club Activity (JJCA) and evaluate its impact on third-year pharmacy students enrolled in an Advanced Diabetes Management elective. Methods: The jigsaw method, a cooperative learning activity in which learners are organized into small groups and then rearranged to share their learning, was used to facilitate a journal club activity in Fall 2019, Spring 2020, Fall 2020, and Spring 2021 at Temple University School of Pharmacy. Each “expert” group, comprised of 4-5 students, was assigned either the methods section or results section of the same diabetes cardiovascular outcomes trial. Fourthought-provoking prompts were assigned as pre-class work for each section. During class, each “expert” group met to discuss their prompts. Then the
groups were rearranged to form new “home” groups in which the methods experts and the results experts taught each other their respective prompts. Throughout class, 2 faculty members circulated to facilitate discussion. At the end of class, debriefing occurred as a full class (19-27 students). Students were invited to complete a survey to gather their perceptions of the activity. Results: Sixty-nine students completed the post-survey (response rate 76.7%). Most students had previously participated in 3 or more journal clubs throughout the curriculum. When asked to compare the JJCA to a traditional journal club format, most respondents preferred the JJCA (80%), thought the JJCA was more engaging (87%), and felt that they learned more from the JJCA (87%). Overall, students agreed that the JJCA improved their ability to analyze and interpret scientific literature (93%). Conclusions: Students enjoyed the Jigsaw Journal Club Activity format and found it beneficial. Considerations should be made to incorporate this format into other courses.

Designing a Team-Based Assignment in Which Pharmacy Students Create Workshops to Promote Soft Skill Development

Michael C. Maiullari, Northeastern University; Melissa A. Gallo, Northeastern University; Michael J. Gonyeau, Northeastern University; John Orr-Skirvin, Northeastern University; Jenny Van Amburgh, Northeastern University.

Objective: Northeastern Bouvé School of Pharmacy integrates professional soft skill development workshops in the curriculum, which due to the pandemic, had to be transitioned to a virtual format. This opportunity led to the development of a longitudinal assignment in which student teams developed their own soft skill workshop based on an educational lesson plan framework. Methods: Workshops centered around two soft skills, chosen from the University’s self-authored integrated learning (SAIL) platform. There were seven soft skill categories: communication, critical thinking, empathy, leadership, positive attitude, teamwork, and other. Teams developed learning objectives, facilitator’s guide, student materials, and a reflective assessment. The assignment was split into three parts to allow for longitudinal feedback incorporated before final submission. Feedback was provided by three senior faculty members and four students completing educational APPEs via newly designed rubrics. Results: Fifteen student teams developed workshops focusing most commonly on communication (40%) and teamwork (37%) of the provided seven soft skill categories. Verbal communication (27%) and collaboration (10%) were the most common specific skills designed. Workshops were highly varied, including activities such as role playing, games, and origami. Students also incorporated many current issues into their workshops, such as diversity training and cultural humility. The three highest scoring teams were selected to have their workshops incorporated into future semesters with the student teams aiding in workshop facilitation. Conclusions: The workshop assignment allowed students to have a direct impact on their education. Faculty members were able to assess what skills the students believe are important for pharmacists in practice. Putting students in a teaching role encouraged them to develop high levels of understanding of their selected soft skills to create a well-rounded workshop for peers.

Developing Leadership and Patient Advocacy Skills Utilizing an Interprofessional Simulation

Amanda Brown, Chapman University, Laressa Bethishou, Chapman University, Reza Taheri, Chapman University, Austin Nation, California State University, Fullerton School of Nursing.

Objective: To assess students’ self-perception of leadership ability, patient advocacy skills, understanding the role of other professions, and interprofessional communication skills pre- and post-simulation activity. Methods: Interprofessional teams of pharmacy and nursing students participated in a virtual simulation interacting with a standardized patient (SP). The scenario was designed to invoke situational leadership and patient advocacy opportunities. Students completed pre-work, which included literature readings on patient advocacy and transition of care, and a pre-survey. The pre-survey included the self-rating of each student’s confidence in four items: abilities of leadership, patient advocacy, understanding the other profession’s role, and interprofessional communication skills. A debrief led by pharmacy and nursing faculty culminated the simulation experience after which students completed a post survey measuring the same four pre-survey items. A Wilcoxon signed rank test was used to analyze the data. Results: Thirty-six second-year pharmacy students and thirty-seven senior nursing students participated in the experience and completed both the pre and post surveys. Student self-rating increased in all four categories as follows: confidence in leadership ability (3.37 vs 3.82, p<.01), patient advocacy (3.77 vs 4.2, p<.01), understanding the other profession’s role (3.34 vs 4.04, p<.01), and interprofessional communication (3.57 vs 4.17, p<.01). Additionally, all post survey respondents remarked that they would recommend this experience to future students. Conclusions: Participation in an interprofessional virtual simulation between pharmacy
and nursing students focused on leadership development and patient advocacy demonstrated a statistically significant increase in students’ confidence in their ability of leadership, patient advocacy skills, understanding the other profession’s role, and interprofessional communication. Further studies with larger sample size are warranted to assess generalizability of these findings.

Development of a Required APPE Readiness Course in a Doctor of Pharmacy Curriculum
Quintin Broussard, Keck Graduate Institute, Gail Orum, Keck Graduate Institute, Minh Dang, Keck Graduate Institute.

Objective: Didactic preparation of Doctor of Pharmacy (PharmD) students is essential for experiential practice. ACPE Standards 2016 describe the need to teach PharmD students knowledge and skills to be ready prior to Advanced Pharmacy Practice Experiences (APPEs); however, limited literature describes how this is assessed at different PharmD programs [Currents in Pharmacy Teaching and Learning 2020;12(7):771-5]. The purpose of this project is to describe the implementation of a newly-required APPE Readiness course taught directly before APPEs to third-year PharmD students.

Methods: The APPE Readiness course was a newly-required 1.5 credit hour 16-week third-year PharmD course at Keck Graduate Institute. The course contained knowledge and skills necessary for students to succeed on APPEs, including oral journal club presentations, written and oral presentations of inpatient and outpatient patient cases, and calculations and law reviews. Students were assessed by standardized grading rubrics for written/oral journal club presentations and a patient presentation-based objective structured clinical examination (OSCE), containing disease states from previous/current courses the students took, and a final examination containing course materials and disease state topics seen commonly in clinical practice. Towards course completion, students were assessed with the Pharmacy Curriculum Outcomes Assessment (PCOA) and the Pre-NAPLEX.

Results: The APPE Readiness course was first implemented at Keck Graduate Institute from January to May 2020. Averages on the written and oral journal club presentations, OSCE, and final examination were 91.4%, 83.6%, 84.1%, and 77.5% respectively. The average PCOA percentile was 56.8, and the average Pre-NAPLEX scaled score was 68.4.

Conclusions: Students in the APPE Readiness course demonstrated proficiency in both pharmacy knowledge and skills needed for APPE Readiness as exhibited by the journal club presentation, OSCE, final exam, PCOA, and Pre-NAPLEX scores.

Development of a Virtual Comprehensive Cardiology Escape Room to Reinforce Knowledge and Skills
Ashleigh L. Barrickman, West Virginia University, Ashlee McMillan, West Virginia University, Marina Galvez Peralta, West Virginia University.

Objective: To develop and assess a virtual escape room to reinforce multidisciplinary cardiology concepts

Methods: A virtual escape room was developed to reinforce cardiology therapeutics, pharmacology, pharmacokinetics, medicinal chemistry, pharmacogenomics and calculations. This interactive activity was implemented at the end of a concentrated systems-based cardiology course to second-year PharmD students. Groups of 4-5 students were divided into Zoom breakout rooms and provided a Google Form link with the virtual escape room puzzles. Students had 40 minutes to complete eight puzzles, and each puzzle had to be correctly solved prior to advancing. After completion, everyone met to debrief. Students completed pre and post-tests to assess knowledge and a post-survey to measure perceptions of the activity. Two knowledge-based questions were included on the final exam to assess retention.

Results: Fifty-five students (79%) completed the surveys. Nine of the 12 groups successfully “escaped” all puzzles. Most students (94.50%) agreed/strongly agreed that logistics of the lab were amenable to learning and applying information, and 94.5% enjoyed working through puzzles. Learners were motivated to try their best to escape (92.70%), and asked for similar activities throughout the curriculum (85.50%). Most students (89.10%) agreed/strongly agreed that their knowledge improved as a result of this activity. Based on pre- and post-tests, student knowledge improved on each question, with statistical significance in six of the eight knowledge-based questions. In the final exam, students were able to recall pharmacology concepts from the escape room (97%), but further reinforcement may be needed for drug-drug interactions (54%).

Conclusions: The virtual escape room was well-received by students, and was an effective learning tool for reinforcing concepts. Implementation of additional virtual escape rooms in the curriculum is being explored.

Development of an Introduction to Pharmacy Residencies Elective Course

Objective: The objective of this study was to develop and analyze a new pharmacy residencies elective course
focusing on preparation and application to pharmacy residency programs. **Methods:** The elective course was designed to increase knowledge and confidence and improve perceptions surrounding residency preparation and serve to fill a gap between curricula and post-graduate preparation. Students were required to apply and receive approval during their second professional year to take the course in their third professional year. Multiple teaching modalities were utilized including standard lectures, interactive discussions, mock interviews, written assignments, and reflection exercises. Students completed pre- and post-course surveys to assess knowledge, self-perceived knowledge, and confidence as it related to different aspects of applying for and securing a pharmacy residency. **Results:** A total of 25 students enrolled in the elective course and all passed earning grades of A’s or B’s. For the purpose of this study, data collected from 17 students was included in the statistical analysis, eight students did not complete the questionnaires. The composite score for knowledge-based items showed a statistically significant difference between pre- and post-course scores ($p<.05$), with improved performance on the post-course survey. Students identified the most beneficial aspects of the course included the residency application process, CV and letter of intent preparation, and participating in mock interviews. Students noted the letter of intent peer review exercise and the residency research project experience as areas for improvement. **Conclusions:** An introduction to pharmacy residencies elective course utilizing multiple teaching methods increased pharmacy students’ knowledge and confidence in pursing residency training. The results of this study will assist in developing and modifying course learning activities to better ensure student success in their post-graduate endeavors.

**Development of Entrustable Professional Activities for Specialist Hospice and Palliative Care Pharmacists**


**Objective:** Develop consensus Entrustable Professional Activities for pharmacists specializing in hospice and palliative care (HAPC). **Methods:** A workgroup of 10 pharmacists, representing diverse training paths and HAPC practice settings nationally, was selected to develop HAPC pharmacists EPAs through an iterative, facilitated process. The workgroup used nominal group and modified Delphi methods to create and refine EPA statements through 4 consensus-building rounds, with interprofessional feedback via snowball sampling in Round 3. Consensus was defined a priori at 60%. After Round 4, feedback was collected via focus groups and surveys from 12 different stakeholder pools to refine and finalize consensus EPAs. This research was supported by Cambia Health Foundation. **Results:** Round 1 yielded 113 draft EPA statements for HAPC specialist pharmacists. Round 2 identified 45 statements that were deemed specific, assignable, and observable. At the end of Round 3, 14 draft statements achieved consensus among the workgroup to be essential entrustable activities for HAPC specialist pharmacists. When 7 interprofessional HAPC team members from 5 disciplines reviewed the draft EPAs, 12 achieved ≥60% consensus, with 10 achieving ≥80% consensus. Two draft EPAs with <60% consensus were further peer-reviewed and refined in Round 4 prior to stakeholder feedback. After incorporating feedback from 12 stakeholder groups, a 15th EPA was added by the HAPC Pharmacist EPA workgroup. Of the final 15 EPAs, 8 achieved 100% consensus, 2 achieved 90% consensus, 3 achieved 80% consensus, and 2 achieved 70% consensus. **Conclusions:** Fifteen consensus EPAs describe essential responsibilities of HAPC specialist pharmacists in direct patient care, leadership, education, and scholarship. Twelve EPAs have overlap with HAPC physician EPAs, while 3 are entirely distinct.

**Drowning in a Bad Dream: The Impact of a Patient Story in an Interprofessional Event**


**Objective:** This study sought to determine the impact of an interprofessional education (IPE) event including a patient discussing his personal journey with substance use disorder (SUD) on third year pharmacy and first year physical therapy students’ empathy and attitudes towards SUD. **Methods:** Students attended a 75-minute IPE event that opened with a patient sharing his experience with SUD which was followed by a brief didactic lecture related to the opioid epidemic. Finally, students divided into small, interprofessional groups to answer discussion questions related to the patient’s SUD experience as well as practice appropriate naloxone technique. The event was facilitated using video conferencing technology across two campuses. Participants completed a pre-survey, a post-survey one week later, and a second post-survey three months later. The surveys measured changes in empathy and attitudes towards SUD using...
validated tools, the Kiersma-Chen Empathy Scale (KCES) and the Short-Understanding of Substance Abuse Scale (SUSS). Results: Eighty-three pharmacy students and 44 physical therapy students attended the event. Pre-survey, post survey 1, and post-survey 2 were completed by 95.3%, 76.4% and 55.1% of participants, respectively. Thirty-eight students (29.9%) completed all three surveys. About one quarter of respondents knew someone with SUD and another quarter knew someone who died from SUD. KCES scores significantly increased ($p < .001$) from pre-survey to post-survey 1 to post survey 2. SUSS disease model scores significantly decreased between pre-survey and post-survey 1 ($p < .001$) and between post-survey 1 and post-survey 2 ($p = .039$).

Conclusions: A single IPE experience about SUD may contribute to sustained improvements in student empathy scores. However, shifting student beliefs towards a disease model of addiction may require additional training.

**Effect of Changing Questions from “All of the Above” to “Select All That Apply”**

Kamila Dell, *University of South Florida.*

**Objective:** Describe the psychometric effect of converting multiple choice questions (MCQ) containing an “all of the above” (AOTA) answer option to a “select all that apply” (SATA) question type. **Methods:** A 50 MCQ summative, end of semester exam was administered to the first-year pharmacy students in 2019 and 2020. Of the 50 questions, eight MCQ included the AOTA answer option in 2019. The eight AOTA questions were converted to SATA type question in 2020. The other 42 questions remained the same between the years. Item difficulty, item discrimination, and point biserial were calculated for all the MCQ included on the exams in the 2 years. Comparison of the psychometrics was performed using an independent samples t-test using Excel. **Results:** Multiple choice questions with an AOTA answer option, when converted to SATA type questions, resulted in significantly different difficulty (0.92 vs. 0.62, $p = .007$) and discrimination (0.10 vs. 0.21, $p = .022$). The point biserial was not statistically different between the question types (0.14 vs. 0.22, $p = .110$) but it did increase the point biserial into the acceptable range (above 0.2). **Conclusions:** Converting “all of the above” type MCQ to “select all that apply” type questions increases the difficulty of the questions and improves the discrimination of the items between exam takers. Even though the point biserial difference was not statistically significant, it was increased enough to be in the acceptable range (above 0.2). MCQ that include AOTA as an answer option are discouraged in the literature and this study demonstrates that this is due to poor discrimination. To improve question performance, MCQ with AOTA answer options should be omitted or replaced with SATA type questions.

**Effect of University-Wide Interprofessional Education Activities on Levels of Cultural Competence Amongst Health Care Students’**


**Objective:** How do interprofessional education (IPE) activities affect the degree of cultural competence amongst students in health profession degree programs? **Methods:** Students from four health care disciplines (pharmacy, nursing, physician assistant, occupational therapy) were invited to complete the validated Global Worldview Cultural Competence Survey (used with author permission) in hard-copy at the start of their respective curriculum and again electronically after completing the required University-wide IPE activities. The IPE activities were held during their first three didactic semesters and included a roles and responsibilities activity, a book club centered on healthcare-related intercultural conflicts, a cross-cultural simulation, and an event focusing on an interprofessional approach to the management of opioid use disorder. Demographics of the student population and curricular exposure to cultural competence for each participating program were collected. Total pre and post survey scores were calculated to determine level of cultural competence. Aggregate pre and post data were analyzed using SPSS. **Results:** Response rates were 95% for pre-survey (n = 190) and 34% for post-survey (n = 62). Seventy-one percent of students (pre survey) versus 82% of students (post survey) scored at the culturally competent/culturally proficient level. There was a statistically significant difference between the pre- and post-score on the cultural competence scale. Students’ average score increased from 117 to 120 demonstrating a higher level of cultural competence and awareness ($t = 81.527; p = .001$). **Conclusions:** Health care education programs may benefit from incorporating University-wide IPE programming to foster development of cultural competence amongst students.

**Enhancing Student Social Emotional Competence in a Telehealth-Based Ambulatory Care Skills Course**

Objective: To determine the impact of a telehealth-based ambulatory care skills course on student social emotional competence (SEC). Methods: Students completed the Social and Emotional Development Inventory (SED-I) at the start and end of the course. The SED-I codes onto four factors: influence, consideration, connection, and self-awareness. Students then wrote a reflection discussing strategies for improving their SEC. Each week, students watched a video depicting a consult between a pharmacist and patient/physician, to prepare for one-on-one simulations. Each video highlighted social emotional techniques utilized by the pharmacist. Teaching assistants (TA) were recruited to serve as a patient or physician. Zoom breakout rooms, consisting of a TA and three students, were utilized for the consults. Each student completed one consult while the other students and TA completed a TA/peer rubric derived from the SED-I. TAs gave verbal feedback to each student with the rubric as the framework. At the semester midpoint, students completed a video log (vlog) reflecting on their SEC and areas of improvement. Results: One hundred eighty-eight students participated in this study. Significant improvement was noted on all factors of the SED-I. Highest gains were noted on the sub-categories; empathy and monitoring while lowest gains were noted on the sub-categories; emotions and sociability. TA assessment showed improvement over the semester. On the vlog, 80% of students noted improvements in their consideration of others and 55% noted improvement in their self-awareness. Eighty-four percent of students “agreed or strongly agreed” that the course was instrumental in helping them understand their SEC.” Conclusions: These findings suggest value in using self-reflections and TA feedback in developing student SEC in a telehealth-based environment.

Evaluating Continuous Glucose Monitoring (CGM) Education in U.S. Doctor of Pharmacy Programs

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Objective: With expanded coverage of continuous glucose monitoring (CGM) devices as a pharmacy benefit, pharmacy students must understand how these devices support diabetes self-management and counsel patients on their use. The objective of this study was to understand how CGM education is being provided in Doctor of Pharmacy (Pharm.D.) programs. Methods: An online Qualtrics survey was administered to 139 accredited Pharm.D. programs in the United States to gather information about provision of CGM education. Pharmacy faculty with diabetes expertise (defined by a credential such as Certified Diabetes Care and Education Specialist (CDCES) or Board Certification – Advanced Diabetes Management (BC-ADM) or who indicated diabetes-focused research or teaching) were identified for each program. A survey invitation was sent to these individuals, with follow-up e-mails and phone calls, two and four weeks later, respectively. Survey data was analyzed descriptively. Results: A total of 57 programs responded (41% response rate). Fifty-one programs (89.5%) provided CGM education for an average of 2.2 hours (n=46, range: 0.1-30). Out of 48 programs providing detailed responses, 29 (60.4%) provided CGM education in required lectures, six (12.5%) in required labs, 22 (45.8%) in elective lectures, and 20 (41.7%) in experiential settings. Hands-on education was provided in 16 (33.3%) programs. CGM education was provided by three programs (6.3%) in the first year, 21 (43.8%) in the second year, 28 (58.3%) in the third year, and 18 (37.5%) in the fourth year. Conclusions: Although most respondents indicated providing CGM education, there is variation in when and how this education is provided. There is a continued need to integrate this education into pharmacy curriculum, and future research should focus on the optimal timing and methods for doing so.

Evaluating Patient Simulation Exercises as Learning Tools

Bernadette R. Cornelison, The University of Arizona, Beth Zerr, The University of Arizona.

Objective: This study evaluates the value of an OSCE as a learning tool. Methods: Pharmacy students completed a multiple-choice exam followed by OSCEs that assessed heartburn and insomnia. Ten weeks later, students completed a cumulative multiple-choice exam. The difference in performance on the first exam compared to the cumulative exam was evaluated for the two OSCE topics versus four topics that were not assessed in the OSCE. Each question was worth 1 point. Differences were evaluated using a two-tailed t-test. Results: A value of <.05 was considered statistically significant. Results: For complex topics, performance improved from the first to the final exam when an OSCE was completed for that topic (heartburn: 1st exam = 0.61 ± 0.49, cumulative exam = 0.78 ± 0.42, mean difference = 0.16, p=.0047, CI [0.04, 0.12]). Alternatively, performance worsened when an OSCE was not completed (motion sickness: 1st exam = 0.61 ± 0.49, cumulative exam = 0.48 ± 0.5, mean difference = 0.13, p=.09, CI [0.12,0.12], and anorectal disorders: 1st exam = 0.93 ± 0.26, cumulative exam = 0.6 ± 0.49, mean difference = -0.33, p<.001, CI [0.06,0.12]). For the relatively simple topics, performance was similar or improved on the cumulative exam regardless of completion of an OSCE (insomnia: 1st exam = 0.91 ±
Evaluation of an EPA-based Remediation Process to Support Personalized Learning

Rachel A. Allen, University of Washington, Jennifer Chang, University of Washington, Curtis Jefferson, University of Washington, Alex Tu, University of Washington, Sharon Wu, University of Washington.

Objective: To evaluate the implementation of an Entrustable Practice Activity (EPA) competency-based assessment and remediation approach to promote personalized learning. Methods: The Pharmacist Provider Series is a longitudinal core course series focusing on skills development and practice readiness. It requires a defined level of competence on key milestones across EPA-based domain areas for progression throughout the PharmD curriculum. Seven EPA-based domains were identified with a minimum passing threshold (85%) for each domain. Students not meeting the threshold were allowed up to two remediation attempts per domain per quarter and up to three attempts per academic year. Student performance and need for remediation over four academic quarters were analyzed within and across domains. Results: All students were enrolled in the Pharmacist Provider Series from Fall of first year through Fall of second year (N=110). Fifty different students completed a total of 113 remediation attempts, with 49 students successfully progressing. The number of remediations per student ranged from one to eight, with 25 students requiring more than one remediation. The domains requiring the most remediations were Calculations, Communication, Evidence-Based Practitioner, and Collaborative Team Member. Of the students completing remediation, 20% required remediation in two domains, 24% in three domains, and 2% in five domains. Conclusions: The characterization of course elements into EPA-based domains allowed for assessment of individual student competence in these key areas, which facilitated early detection of potential learning gaps. The targeted remediation approach provided additional support and personalized learning in the domain areas needing development. A majority of students were successful in meeting the predetermined level of competence through the remediation process. One consideration is the significant time commitment from faculty and staff associated with supporting remediations.

Evaluation of Health Equity Content in the Pharmacy Curriculum

Hanna E. Persha, Purdue University College of Pharmacy, Rahki Karwa, Purdue University, Jasmine Gonzalvo, Purdue University.

Objective: The objective of this study was to evaluate the syllabi across the curriculum at a College of Pharmacy to identify courses that provide health equity instruction. Methods: A comprehensive review of syllabi from 2019 was conducted of all required and elective pharmacy courses in the four-year professional phase of the Doctor of Pharmacy program. Each syllabus was reviewed for specific key words, including health equity, social determinants of health, LGBT+, gender, race/ethnicity, language, diversity, vulnerable/underserved populations, culture, health literacy, poverty, discrimination, access to healthcare, disparity, and disability. Categories of the syllabi reviewed included course objectives, PharmD outcome ability goals, and lecture topics. Results: The syllabi of 36 core courses and nine electives were reviewed. Use of the key words in the 45 courses were as follows: culture (11), diversity (8), gender (4), health literacy (3), race/ethnicity (2), vulnerable/underserved (2), disparity (2), and LGBT+ (1). All other key words were not observed in the syllabi for core or elective courses. Five therapeutics course syllabi were evaluated and two featured key words: diversity (1), culture (1), and gender (1). These courses account for 30 credit hours of the pharmacy program. Of the six professional program lab course syllabi reviewed, two of them included the key word culture. These courses are where the skills represented by the key words should be practiced. Conclusions: The data generated from the syllabi review demonstrates the need to incorporate health equity content in an intentional fashion in the curriculum. Based on these study findings, a semi-structured interview of faculty and a student survey support this study in gaining a deeper understanding of health equity in the curriculum.

Evaluation of LGBTQ+ Cultural Competence Among Student Pharmacists

Kevin N. Astle, Auburn University.

Objective: To evaluate and compare the attitudes and behaviors of student pharmacists regarding the provision of pharmacy services to LGBTQ+ patients. Methods: Student pharmacists at Auburn University Harrison School of Pharmacy (AUH SOP) and Kingston University School of Pharmacy (KUSOP) were administered the Gay Affirmative Practice (GAP) Scale, a validated 30-item survey that assesses healthcare practitioners’ beliefs and behaviors related to providing healthcare to gay and lesbian patients.
Participants were invited to participate through their attendance at an educational program focused on providing pharmacy care to LGBTQ+ patients. Participants from AUHSOP were enrolled in an elective course focused on LGBTQ+ healthcare and KUSOP participants attended a two-hour lecture on LGBTQ+ healthcare. Participants from AUHSOP were invited to complete both a pre-and post-survey while participants from KUSOP only completed a pre-course survey. Data were analyzed using descriptive statistics. **Results:** Survey responses were received from the following: AUHSOP pre-course (n=22), AUHSOP post-course (n=8) and KUSOP pre-course (n=52). Overall respondents indicated that they share beliefs and behaviors in providing affirmative care to LGBTQ+ patients. Differences exist between the responses between AUHSOP and KUSOP participants; however, these differences may be attributed to sampling bias. Survey responses from AUHSOP participants after attending an elective course on LGBTQ+ healthcare were primarily similar to pre-course responses, with an increase in anticipated behaviors for attaining education and providing care for LGBTQ+ individuals. **Conclusions:** Overall, the results from this survey indicate that student pharmacists share inclusive beliefs and behaviors for providing care to LGBTQ+ individuals, however, there is substantial room for improvement. Future studies will seek to explore a more broad understanding of the beliefs and behaviors of both student pharmacists and practicing pharmacists across the United States.

**Evaluation of Second-Year Student Performance in Didactic and Skills Lab Courses and APPE Performance**

Andrea L. Porter, **University of Wisconsin-Madison**, Shweta Shah, **University of Wisconsin-Madison**, Michael Pitterle, **University of Wisconsin-Madison**, Casey Gallimore, **University of Wisconsin-Madison**, Edward Portillo, **University of Wisconsin-Madison**, Kimberly Lintner, **University of Wisconsin-Madison**.

**Objective:** To evaluate the association of second-year student performance in didactic courses with their patient care skills-based laboratory and advanced pharmacy practice experience (APPE) performance. **Methods:** Student scores from second-year fall and spring semester didactic courses and skills laboratory exams and APPE scores were collected for three cohorts of students (graduating classes of 2018 to 2020). Data were coded to identify students who performed poorly in didactic courses (Score < 78%), patient consultation exams evaluated for both communication and content skills (Score < 78%), and APPE courses (Score < 83%). Fischer’s exact tests were performed to assess relationships between didactic, skills laboratory, and APPE course performance. **Results:** Of 396 students, there were 48 APPE poor performers (12%). There were 0 and 5 poor performers in skills laboratory consult communication skills (0-1%), and 37 and 76 poor performers in consultation content skills (9 and 18%) respectively in the fall and spring semesters. Poor performers in didactic courses varied from 41 to 158 (22-38%). Student performance in Clinical Pharmacokinetics and Pharmacotherapy II didactic courses were significantly associated to the corresponding skills laboratory performance in consult content in both semesters (p<.05), whereas only fall skills laboratory performance in consult content skills showed significant association with poor performance during APPEs (p<.05). Laboratory performance in consult communication skills was not significantly associated with didactic or APPE performance because student performance showed little variability. **Conclusions:** Student consultation performance in patient care skills laboratory courses was associated with didactic course performance and poor performance in their APPE courses. Additional evaluation of the entire curriculum is needed to determine other predictors of poor APPE performance.

**Evaluation of SOAP Note Performance in a Pharmacotherapeutics Course after Implementation of a Peer-Review Process**

Melissa Chudow, **University of South Florida**, Bao Anh Tran, **University of South Florida**, Morgan Thompson, **University of South Florida**, Kamila Dell, **University of South Florida**.

**Objective:** To compare student grades on SOAP notes in the Pharmacotherapeutics IV course before and after implementation of a peer-review process. **Methods:** Third year pharmacy students complete two SOAP notes in the Pharmacotherapeutics IV course. A peer-review process was implemented in the Spring 2020 semester. Students were introduced to the process and provided instruction on the rubric at the beginning of the semester. After each SOAP note submission, students were randomly assigned a peer’s SOAP note to evaluate utilizing the same rubric as the faculty grader. SOAP note grades were compared between the 2019 and 2020 cohorts to determine if performance was improved with the peer-review process. **Results:** Ninety-eight students were included in Spring 2019 and 92 in 2020. Faculty grades were different between the cohorts for the first SOAP note (75.2% vs. 82%, p<.001) but not for the second (84.6% vs. 85.4%, p = .489). During both years, the second SOAP note had a higher average grade than the first (p<.001). The peer-review grades were statistically significantly higher for both SOAP notes compared to faculty grades (p<.001). The peer review
Examining the Correlation Between Pharmacy School Metrics and NAPLEX Success

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Objective: Colleges of pharmacy recognize the value of identifying students at-risk for failing NAPLEX and providing early intervention. Multiple studies have evaluated NAPLEX predictors in both the pre-pharmacy and pharmacy years with mixed results. Pharmacy school metrics have been limited to cumulative GPA and GPA by academic year. Therefore, this study aimed to determine the correlation between NAPLEX scaled score and pharmacy school metrics such as GPA by academic year, cumulative GPA, and PCOA at a private, 4-year program. Methods: This was a retrospective evaluation of College of Pharmacy graduates at a single college of pharmacy from 2015-2019 who took NAPLEX and did not have delayed academic progression. Data analysis included pharmacy school metrics: GPA by academic year, cumulative GPA, number of remediations offered, and PCOA percentile. Correlations between NAPLEX scaled score and pharmacy school metrics were determined using Spearman correlation coefficients. Results: A total of 250 students were included in the analysis. GPA by academic year was correlated to the NAPLEX scaled score (r=0.001) with P1-P3 years each demonstrating higher correlations (R=0.523 to 0.554) compared to the P4 year (R=0.363). Both cumulative pharmacy GPA and PCOA were independently associated with NAPLEX scaled score (R2=0.425). When controlling for GPA and PCOA, the number of remediations, pre-pharmacy GPA, and PCAT were not predictive of NAPLEX scaled scores (p>0.05). Conclusions: GPA by academic year, cumulative pharmacy GPA, and PCOA scores are all independently associated with NAPLEX scaled scores. These metrics could be used as part of an early intervention program to improve NAPLEX pass rates.

Exploring Pharmacy Students’ Perceptions of a Health and Wellness Curriculum in a Core Course Series

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Objective: A growing body of evidence suggests that pharmacy students are experiencing increasing levels of stress and reporting declining health-related quality of life. While calls for inclusion of wellness content in pharmacy curricula have been published, research on the integration of health and wellness into the core pharmacy curriculum is limited. Our objective was to explore student perceptions on the incorporation of health and wellness as part of the Pharmacist Provider core course series focusing on practice readiness. Methods: All first- and second-year students attended weekly or bi-weekly interactive hour-long sessions focused on health, wellness, and well-being during this two-year course series. At the end of Fall quarter, students reflected on the following question: “How has the class time devoted to health and wellness affected you?” Using inductive thematic analysis, investigators qualitatively analyzed de-identified student reflections and used an iterative approach to open and axial coding to identify themes. Results: A total of 213 first- and second-year students completed the reflection. One-hundred sixty-three students (76.5%) indicated a positive impression of having devoted time, while five students (2.3%) indicated the time was not beneficial. These sessions encouraged 62.0% of students to personally apply health and wellness strategies, and reinforced or strengthened values regarding the importance of this topic in 57.7% of students. Additionally, students identified personal barriers, such as the pandemic and stress from work and school. Conclusions: Students found value in the health and wellness curriculum, which reinforced their personal and professional development. Results were generally positive but more research is warranted. Preliminary findings suggest that health and wellness may be included in pharmacy programs as core content to foster a culture of wellness.

Exploring the Relationship Between Grit, Work Engagement, and Career Success Among U.S. Pharmacists

Nareeta A. Sharma, University of the Pacific, Myo-Kyoung Kim, University of the Pacific, Dan Ho, University of the...

Pacific, Rajkumar J. Sevak, University of the Pacific, Mark Stackpole, University of the Pacific, Linda Norton, University of the Pacific.

Objective: The purpose of this study is to investigate the effect of grit and work engagement on career success among practicing pharmacists in the United States (U.S.). A secondary objective is to identify how pharmacists describe career success. Methods: This cross-sectional study was conducted through an anonymous, online survey distributed to pharmacists throughout the U.S. The 65-question survey included the Grit-S, UWES-9, and SCSI scales to measure grit (goal-oriented resilience), work engagement with positive emotions, and subjective career success, respectively. The survey captured demographics, included validity questions, and asked open-ended questions to describe career success. After validity testing, multiple regression analysis was performed using SPSS® to examine the impact of grit and work engagement on subjective career success. Open-ended responses underwent conventional content analysis. Results: 586 survey responses were included in the data analysis. Multiple regression analysis revealed that both work engagement (ρ<.001, ß=0.52) and grit (ρ<.001, ß=0.18) uniquely accounted for variation in subjective career success, with the variables collectively explaining 36.7% of the variation (R=0.6060, ρ<.001). Work engagement is a stronger predictor than grit, supported by the comparison of the standardized coefficients. However, grit is not a significant moderator of the relationship between work engagement and success (∆R2=0.001, ρ=.437). Qualitative analysis indicated that the three most common themes pharmacists employed to describe career success included “positive impact” (41%), “satisfaction” (29%), and “recognition” (13%). “Financial compensation” (4%) was among the least common themes utilized to describe success. Conclusions: Cultivating grit and encouraging a positive work-related mindset within pharmacy education may lead to students’ potential career success. Understanding what pharmacists value as markers of success may be beneficial for pharmacy educators to consider when promoting intrinsic motivation in students.

Factors Influencing Inclusion of Spirituality in Patient Encounters During General Medicine Advanced Pharmacy Practice Rotations

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Objective: Although there is growing interest in the role of patient spirituality in optimizing health care outcomes, little is known about the factors that influence student pharmacists’ willingness to address patient spirituality. Given that patients’ spirituality can play a role in their health, this study sought to identify factors influencing student pharmacist inclusion and exclusion of spirituality in patient interviews, therapeutic assessment, and medication plans. Methods: Each 4th year pharmacy student received a link to a web-based survey instrument on the final day of their general medicine Advanced Pharmacy Practice Experience (APPE) rotation. Student demographics, rotation site characteristics, factors influencing inclusion or exclusion of spirituality in patient care, and measures of self-perceived spirituality/religiosity were collected. Results: Thirty-three students completed the study, with the cohort mostly identifying as female (87.9%), Caucasian or Asian (45.5%, 42.4% respectively), single (63.6%) and Catholic (42.4%). Approximately 6.7% of students asked patients about impact of spirituality on their health and 20% included factors of spiritual or religious nature in their therapeutic assessment and plans during their general medicine rotation. The three most common reasons to include patient spirituality were “patient-initiated discussion,” “presence of chaplain on team” and “example modeled by my preceptor” (27.3%, 27.3% and 18.2% respectively). Spirituality was most commonly excluded due to “time available,” “example modeled by preceptor,” “personal view of spirituality role in healthcare” (36.4%, 33.3% and 21.2% respectively). Conclusions: Preliminary findings show that pharmacy students in general are reluctant to ask about patient spiritual or religious beliefs as related to healthcare but will often address them when the topic is initiated by others (patient, chaplain, or preceptor). Student reasons for spirituality exclusion mirror traditional barriers across training level and medical discipline.

Faculty and Student Experiences in Online Pharmacy Electives During a Pandemic

Michelle Zagar, The University of Louisiana at Monroe, Laurel Sampognaro, The University of Louisiana at Monroe, Jessica Brady, The University of Louisiana at Monroe.

Objective: In 2020, higher education quickly transitioned to online teaching and learning in a pandemic. Our objectives were to evaluate approaches to and faculty and student perceptions of online pharmacy elective courses during Fall 2020. Methods: Faculty and students participating in Doctor of Pharmacy (PharmD) electives completed IRB-approved online surveys to evaluate topics including methods of course delivery and communication; confidence in and previous use of technology; and course enjoyment. IBM SPSS Statistics, Version 25 was used to perform Wilcoxon Signed Rank tests and descriptive analysis. Results:
Seventeen (41.46%) faculty and 55 (34.16%) students responded to the surveys. Of these, 75% of faculty and 60% of students had not chosen to participate in online courses prior to the Fall 2020 semester. Half of faculty reported online synchronous delivery as the primary form used in their class while the other half reported a mix of synchronous and asynchronous classes. The majority (75%) used email as the primary communication method. Throughout the semester, faculty confidence in using Zoom breakout rooms significantly increased \((p = .034)\); student confidence significantly increased in use of Microsoft Teams \((p = .000)\), Nearpod \((p = .000)\), Zoom \((p = .021)\), and Zoom breakout rooms \((p = .001)\). Of students, 86.7% agreed that they would take the elective in the same format again while 62.5% of faculty responded they would teach the course in the same format again. Conclusions: Despite limited previous online course participation, faculty and student confidence in using new educational technology increased during the study period. New delivery methods for elective courses were favored by students, with less buy-in seen among faculty. Participant feedback will help guide successful online teaching and learning practices and investigate areas of improvement for future courses.

Flip the Cabinet: Online Assessment of Self-Care Skills

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Objective: To describe a self-care assignment utilizing a discussion platform that integrates with a learning management system to provide video prompts and evidence-based video responses to questions. This assignment engaged students in an asynchronous learning activity during pandemic online transition. The assignment provided students opportunities to demonstrate skills in literature retrieval by researching topics not covered in depth in class. Additionally, the assignment provided opportunities to practice patient counseling skills by providing evidence-based responses. Methods: In each cohort, students selected one of four drug information questions posed by different community participants as reviewed on the FlipGrid video discussion platform. A total of twenty drug information questions were released. Student responses were uploaded through the video discussion platform, and evaluated per an integrated rubric assessing verbal communication, practicality and accuracy of response, use of credible references, and accuracy of referencing supporting evidence. Student impressions of the assignment were also reported. Results: 97% of students completed the assignment, with responses for 19 of twenty questions posed. Scores reflect students performed highly on the verbal communication aspect, but improvements can be made in the practicality and accuracy of responses. The majority of students felt the assignment was an effective way to improve pharmacy practice knowledge and skills. Conclusions: Students found the activity to be an engaging way to present timely responses to drug information related to self-care questions over traditional paper-based responses. The technology of the discussion platform was easy to use and has potential for improving student engagement while providing opportunities of skill demonstration by student pharmacists. Easy integration with the learning management system allows this free resource to be accessible by other institutions.

Identification of Major Factors Impacting Student Pharmacists’ Professional Organization Involvement

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Objective: Professional organization involvement is theorized to augment students’ personal and professional development; however, few studies have identified major influences behind students’ motivation to participate. This study’s goals were to characterize attributes of student pharmacists who are highly and minimally involved in professional organizations and evaluate motivating and discouraging factors that influence involvement. Methods: A national electronic survey was distributed from the Rho Chi National Office to chapter presidents for dissemination to local members. Data was collected over a 14-day period, with a reminder sent on day 10. The survey consisted of 15 questions that collected demographic information, assessed professional organization involvement, and identified factors influencing participation. Results: Of the 329 respondents, most were female, 20-24 years of age, White or Caucasian, and in the third professional year. Analyses showed that highly involved students were more likely to cite leadership and personal development opportunities (35.1%) or general interest in the organization’s vision and mission (29.3%) as the most prominent motivating factor compared to minimally involved students (19.7% and 22.4%, respectively). Minimally involved students more often ranked time constraints due to job obligations or personal commitments (44.7%) as the most prominent discouraging factor than highly involved students (26.6%). Furthermore, highly involved students were more likely to perceive opportunities for leadership (98.2%), mentorship from professionals (89.2%), and philanthropy (58.6%) as professional organization benefits. Conclusions: Highly
involved student pharmacists seek opportunities for leadership and personal development and believe in the organization’s vision and mission. Minimally involved students cite time constraints as the greatest factor that prohibits their involvement. Considering these findings, suggestions, such as providing more leadership roles and offering virtual events, may help foster engagement among student pharmacists.

**If at First You Don’t Succeed: Improving Student Learning and Retention Through Multiple Attempts**

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**Objective:** To determine if allowing multiple quiz attempts results in better retention of learned material and increased student performance and satisfaction in a solid organ transplant elective compared to a single attempt. **Methods:** Second- and third-year students enrolled in the elective take nine challenging, case-based, open-note, post-class quizzes which account for 60% of the overall course grade. In 2019, students were given a single attempt per quiz; in 2020, scores were an average of three allowed attempts. Student retention of material was assessed using a quiz game at the beginning of the subsequent class period. Year-to-year comparisons were conducted based on quiz timing, performance data, and post-class surveys. Chi-square and t-tests were employed for comparisons. **Results:** In 2020, an average of 73.5% and 65.4% of students utilized 2 and 3 attempts per quiz, respectively. The mean time spent on quizzes did not increase significantly (40.3 versus 37.7 minutes, \( p = .09 \)). Multiple-attempt quiz averages in 2020 were significantly higher than unadjusted single-attempt quiz scores in 2019 (92.3% versus 81.2%, \( p < .0001 \)). The overall percentage of students responding correctly to the in-class quiz game questions assessing retention was 77.2% in 2020 versus 49.0% in 2019 (\( p < .0001 \)). Though not statistically significant, the percentage of students indicating that the quizzes were a favorite component of the course within the post-class survey increased in 2020 (44.0% versus 23.1%, \( p = .14 \)); identification of quizzes as an area for course improvement declined (12.0% versus 38.5%, \( p = .05 \)). **Conclusions:** The introduction of multiple-attempt quizzes significantly improved retention and performance. Student satisfaction with the quiz component of the course numerically improved. Providing multiple attempts at mastery may empower students to take a higher level of control over their learning.

**Impact of a Capstone Course Re-Design on Skill Development of Pharmacists’ Patient Care Process Steps**


**Objective:** To evaluate the impact of a course re-design on skill development of Pharmacists’ Patient Care Process (PPCP) elements in a third-year pharmacy student capstone course designed to advance patient work-up skills. **Methods:** Course innovations (patient work-up form, faculty class framework, exam practice session and modeling videos) were implemented in 2019 based on results of a qualitative analysis of 2018 student end-of-course evaluations. Final exam performance was evaluated between students enrolled in the 2018 and 2019 courses for pre-determined clinical skills. Logistic regression was used to calculate an odds ratio (OR) while controlling for potential confounders that may impact student performance. **Results:** A total of 265 exams were analyzed and 255 included in the analysis. There was no significant difference in the final exam score between 2019 and 2018 (66% vs 63% \( p = .1307 \)). Students in the 2019 course were found to have higher odds: identifying (OR 8.481 [95% CI 1.023 to 70.298]), determining drug of choice (OR 2.909 [95% CI 1.336 to 6.330]), and monitoring (OR 3.023 [95% CI 1.601 to 5.708]) for the primary problem; identifying all secondary problems (OR 2.103 [95% CI 1.336 to 6.330]), and monitoring (OR 8.481 [95% CI 1.613 to 4.775]) and managing (OR 1.851 [95% CI 1.098 to 3.121]) drug-disease interactions. Students in 2019 also had lower odds of identifying the correct dose of drug for primary problem (OR 0.187 [95% CI 0.105 to 0.33]) and monitoring secondary therapy (OR 0.473 [95% CI 1.061 to 4.165]), and identifying (OR 2.775 [95% CI 1.613 to 4.775]) and managing (OR 1.851 [95% CI 1.098 to 3.121]) drug-disease interactions. Students in 2019 also had lower odds of identifying the correct dose of drug for primary problem (OR 0.187 [95% CI 0.105 to 0.33]) and monitoring secondary therapy (OR 0.473 [95% CI 0.278 to 0.805]). **Conclusions:** While exam scores were similar, there were six areas in which students had statistical improvement in clinical skills. The 2019 course re-design innovations had a positive impact on student skill development.

**Impact of a Community Lab Pharmacogenomics Module on Student-Perceived Pharmacogenomics Competency and Counseling Ability**


**Objective:** This retrospective cohort study evaluated students’ self-perceived ability to demonstrate Genetics and
Genomics Competency Center (G2C2) competencies before versus after a pharmacogenomics (PGx) module in an advanced community pharmacy lab. **Methods:** Before and after lab, students provided self-assessment data using a Likert Scale to describe their G2C2 competency level across 15 pharmacogenomics competencies. During the lab, students evaluated a patient case including PGx test results and utilized PGx resources to answer questions about the case. Students then made evidence-based clinical recommendations to optimize safety and efficacy of psychiatric medications. Individual students’ patient counseling techniques and pharmacotherapy decision-making were evaluated using rubrics. Correlation analysis was conducted to identify associations between self-perceived changes in competency from baseline and actual ability demonstrated through the counseling interventions. **Results:** Compared to baseline, self-perceived G2C2 competency levels significantly improved by an average of 8 points following the lab (total possible points = 75, $p < .0001$). For 14 of the 15 individual G2C2 competencies, there was also a significant improvement in self-perceived G2C2 competency compared to baseline ($p < .0001$ for all 14 competencies). The only competency for which there was not a significant improvement was the appreciation of disease predispositions as an incidental finding of PGx testing. Of note, this competency had the highest self-perception score at baseline, with less room for improvement compared to other competencies (mean score = 4.07 out of 5 at baseline). Actual counseling ability, including pharmacotherapy knowledge, was significantly, positively correlated with changes in self-perceived G2C2 competency level from baseline ($r = 0.24, p = .0016$). **Conclusions:** A Community Lab PGx Module facilitated significant increases in self-perceived G2C2 competency and is positively correlated with actual PGx pharmacotherapy decision-making and counseling ability.

**Impact of a Debate-Style Course on Doctor of Pharmacy Students’ Opinions on Health Care Topics**

Michael Steinberg, *MCPHS University Worcester/Manchester*, Donna Bartlett, *MCPHS University Worcester/Manchester*.

**Objective:** To evaluate the impact of a novel debate-style elective course on pharmacy students’ opinions of current health care topics. **Methods:** This project was approved by the University’s Institutional Review Board. An Oxford-modeled debate-style elective course was designed for second year students in our accelerated Doctor of Pharmacy program. It was first offered in spring 2020. The course included a lecture on forming intellectual opinions using logic, taking into consideration ethical, moral, personal, and societal factors. Topics for subsequent debates were provided ahead of each class for students to prepare their discussion points. Students were assigned roles (pro or con) by the instructors regardless of students’ existing opinions. **Results:** Fifteen students took part in the course and 11 completed the pre- and post-course surveys. Most students (90.9%) felt the course solidified their pre-existing opinions, while 36.4% felt the activities improved their comfort level speaking in an open forum. Five students (45.5%) felt they developed a better ability to persuade others. Most students (63.6%) felt they were able to form opinions based more on fact and less on emotion as a result of the course, with 45.5% and 36.3% more likely to discuss health topics outside of class or seek out opportunities to develop opinions on health care topics, respectively. **Conclusions:** A debate-style course of current health care topics provides students with an empowering experience that improves their communication of matters that affect pharmacists.

**Impact of an Experiential Activity on Pharmacy Students’ Perceptions and Understanding of Advance Care Planning**


**Objective:** Advance Care Planning (ACP) activities can expose student pharmacists to decision making considerations in serious illness that will be encountered in personal and professional life. The objective of this study was to evaluate the impact of an advance directive (AD) assignment on student pharmacists’ attitudes and perceived knowledge about ACP. **Methods:** Student pharmacists previously enrolled in an elective palliative care course from January 2017-May 2020 were invited by email to give informed consent to have their AD assignment analyzed by the research team. The AD assignment was a reflective questionnaire that students submitted after learning about ACPs and completing their own ADs. Paired samples of retrospective post-then-pre questions from multiple-choice questions were analyzed with a Wilcoxon signed ranks test, for ordinal data, and a McNemar test, for nominal data. For non-paired data points, percentages were calculated. **Results:** 22 students enrolled in the study. Three students (13.6%) completed ADs prior to the course. There was a significant increase in students’ beliefs that ACP is essential for a person of their age ($p < .0001$). Students’ self-reported knowledge
about ACP significantly increased ($p<.0001$). After the course ACP activities, students were more likely to talk to others about their own ACP ($p = .0002$) and talk to other people about their ACP ($p = .0015$). 64% of students discussed and learned about the ACPs of people in their lives. 100% of study participants would recommend the ACP assignment be continued as a component of the course. **Conclusions:** An AD assignment increased perceived knowledge and had a positive effect on students’ attitudes about ACP.

**Impact of an Integrated Community Pharmacy Counseling Exercise on Performance of Entrustable Professional Activities (EPAs)**

Andrew Straw, Cedarville University, Grace Hong, Cedarville University, Haylee Moser, Cedarville University School of Pharmacy.

**Objective:** Determine if a student’s level of entrustability improved after performing required counseling simulations at a local community pharmacy in a first-year self-care course. Determine if counseling simulations are correlated with higher OSCE scores. **Methods:** First-graduate-year pharmacy students enrolled in Introduction to Self-Care participated in two required counseling simulations in the OTC aisle of a local community pharmacy. During dedicated class time, students reported to the pharmacy to counsel a faculty member simulating a patient. Self-care case studies and scoring rubric from the APhA Pharmacy Library were used to evaluate student performance on material previously covered in class. Faculty provided brief, formative feedback on the student’s performance after each session. Rubric components were mapped to appropriate levels of the Patient Care Provider Domain of the EPAs. A paired t-test compared OSCE scores from the 2018 cohort (no simulations) to the 2019 cohort (with simulations). **Results:** Seventy-four students participated in the simulation exercises from 2019-2020. Comparing total rubric score from simulation A to B, 82.5% of students increased score, 6.8% had the same score, and 10.8% had lower scores. Of 10 rubric questions, only one did not show a statistically significant increase in EPA level from simulation A to B ("Made a clear recommendation in response to the patient’s concerns", $p = .058$). The average OSCE score between the 2019 and 2020 cohort increased from 43.2 to 53.7, $p = .066$. **Conclusions:** On-site counseling simulations at a community pharmacy are a helpful course component to improve student’s level of entrustability in the patient care provider domain but may not directly result in increased OSCE scores.

**Impact of Asynchronous Virtual Learning on Well-Being and Success**

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**Objective:** 1) To evaluate PharmD students’ well-being and perceived academic engagement when moved involuntarily to a primarily asynchronous virtual curriculum in response to the COVID-19 pandemic and 2) To assess demographic predictors relating student well-being and academic engagement. **Methods:** In January/February 2021, students from The Ohio State University College of Pharmacy participated in an anonymous, online survey (QualtricsTM) The survey, which was created by our team using the literature as a guide, was sent out to professional-year 1-3 students completing didactic coursework in the Doctor of Pharmacy program. Data collected included demographics, well-being, and opinions of impact of participating in a primarily asynchronous virtual curriculum due to the COVID-19 pandemic. Students were incentivized to participate with a raffle for gift cards. The primary outcome was measured using descriptive statistics from the survey to assess students’ well-being and perceived academic success during the shift to virtual and asynchronous teaching pedagogies due to COVID-19. **Results:** Participants ($n = 150$) were predominantly female. most students reported having increased free time (46.6% agreed). Interestingly, a majority of students (56.3%) were interested in continuing the asynchronous curriculum with an in-person aspect involved. In spite of most students reporting increased free time, a large number of students reported a decrease in overall wellbeing (44% decreased). **Conclusions:** A self-reported decline in well-being among pharmacy students occurred during the shift to virtual and asynchronous teaching pedagogies due to COVID-19.

**Impact of Incorporation of a State’s Health Information Exchange EHR on Students’ Documentation Abilities**

Brittney Meyer, South Dakota State University, Alex Midendorf, South Dakota State University, Teresa Seefeldt, South Dakota State University, Brooke Nibbelink, South Dakota State University, Scout Forbes-Hurd, South Dakota State University.

**Objective:** OutcomesMTM has been utilized with paper cases in an activity related to collection of patient
information and documentation. Access to the state’s health information exchange, SD Health Link (SDHL), was added to further emulate practice and address outcomes of collecting patient data from multiple sources. We assessed the impact of transitioning to an EHR from paper cases for the COLLECT PPCP step on students’ ability to appropriately document Medication Action Plans (MAPs). Methods: An academic partnership with SDHL was developed to incorporate its use as an EHR and innovative approach to prepare students for use in future practice. Students reviewed SDHL’s patient records instead of paper cases, then interviewed the patient as part of a CMR. Students assessed the information and formulated a plan, which was documented for the patient as a written MAP. For this introductory activity, accurate and complete documentation of allergies, OTC and prescription medications was graded. A rubric was provided. One instructor completed grading each year. Results: Average Fall 2020 MAP scores (with SDHL) were 4.56/5 points (91.3%) compared to 4.43/5 points (88.6%) for Fall 2019 (without SDHL). Faculty noted that students collected additional disease state and health information beyond the medication list with use of SDHL compared to previous years. A learning curve with first time use of the EHR was noted, but students caught on quickly. Conclusions: A collaboration with the state’s health information exchange in addition to use of OutcomesMTM was successful in providing students practice utilizing real-life health information technology. Students’ MAP documentation skills improved from the previous year despite added technology and complexity. Future assessments will measure impact of the EHR on student’s ability to ASSESS, PLAN, and IMPLEMENT.

Impact of Individual Genotyping on Student Knowledge and Perceptions of Pharmacogenomics

Jordan Baye, South Dakota State University, Wenfeng An, South Dakota State University, Teresa Seefeldt, South Dakota State University.

Objective: To determine whether availability of individual CYP2C19 genotyping improves knowledge and perceptions of pharmacogenomics in a pharmacy lab. Methods: We created a novel lab activity focusing on CYP2C19-clopidogrel pharmacogenomics (PGx) within the second year of our PharmD curriculum. An evaluation of student knowledge and perceptions of this activity was planned, and IRB approval was sought prior to performing this study. Students were consented and randomized into two groups: genotyping and non-genotyping. All students received a lecture on clopidogrel and the CYP2C19 gene. Those in the genotyping group had their CYP2C19 gene sequenced and received the raw sequence data; students in the non-genotyping were given generic results. Lab activities utilized a brief lecture on clopidogrel and the CYP2C19 gene, an activity on interpreting sequencing data, and two clinical cases to reinforce learning. Pre- and post-assessment involved (1) a survey of student impressions of pharmacogenomic and (2) a short quiz to test knowledge. Results: 79 students consented to participate in this study: 30 in the genotyping group; 49 in the non-genotyping group. Among the entire class, PGx knowledge improved from 4.3 (of 10) in the pre-lab quiz to 6.48 in the post-lab quiz (p<.001). The genotyped group did not show a statistically significant difference from the non-genotyped group (mean difference 2.17 vs 2.18, p=.97) in quiz scores. Student perceptions of PGx were statistically different pre- and post-lab in 9 out of 10 questions. Conclusions: Use of personal PGx data did not significantly improve PGx knowledge as compared to students using generic results. However, the educational activity itself demonstrated improvement in knowledge pre- and post-activity. Student perceptions of PGx were more positive overall after the activity.

Impact of Limiting Short-Acting Opioids on Chronic Pain Management in Veterans at VA Loma Linda

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Objective: To compare the effects of short-acting (SA) opioid dose reductions on patient-reported pain level. Secondary objectives assessed SA opioid restrictions on reduction of total morphine milligram equivalents (MME) and additional referrals to addiction or other services. Methods: This is an IRB-approved retrospective observational study. Inclusion criteria: patients receiving 90 consecutive days of SA opioid prescriptions from 02/01/15 to 05/31/16. Exclusion criteria: cancer/chemotherapy, hospice/palliative care, liquid opioid formulations, tramadol, and combination buprenorphine and naloxone. Descriptive statistics were used to analyze demographics, pain level, and psychiatric comorbidities. Paired t-tests were used to compare pre- and post-MME with statistical significance defined as p<.05. Linear regression analysis was used to characterize the relationship between patient-reported pain level and MME. Results: A total of 535 patient charts were included. Patients had a mean age of 60.4 +/- 11.01 years, with chronic lower back pain (61.3%) being most common. When comparing SA opioid dose reductions with pain levels, 64.3% of veterans did not
experience a change in pain level from the baseline. The difference of the total MME between the start and end of the study period was statistically significant ($p<.001$). The average percent reduction of opioid doses from the beginning to the end of the study was 11.5%. At the start of the study, 17% of patients were prescribed concurrent long-acting (LA) opioids, and by the end, this amount increased to 26%. Additional opioid-related referrals to other services were less than 5%. **Conclusions:** SA opioid and MME dose reductions had no change in patient-reported pain level. Quantity restrictions of SA opioids resulted in either increased strengths of current SA opioid prescriptions and/or additional LA opioids.

**Impact of Supplemental Instruction on Academic Performance of Students in a Course**


**Objective:** To evaluate the impact of a Supplemental Instruction (SI) program on academic performance of students. **Methods:** An SI program was piloted in a pharmacy course. Students that previously performed well in the course served as SI leaders to facilitate weekly guided sessions which included lecture highlights, cases, practice questions, and games. The course included five exams and student attendance at SI sessions were recorded. A linear mixed effects model was used to examine whether SI participation improved outcome on exams. Fixed effects in the model were the level of participation in sessions and the exam taken. The individual student served as a random effect to control for repeated measures. A Wald F test was used to determine significance on the fixed effects using the method by Kenward and Roger to adjust degrees of freedom, with pairwise marginal means computed for post-hoc analysis. **Results:** Students showed significant differences depending on both the exam taken ($p<.0001$) and their degree of participation in study sessions ($p<.0001$). Greater participation in study sessions led to higher exam scores with full participation being higher than half and no participation ($p<.01$, $p<.0001$, respectively). Full participation also led to higher exam scores compared to one-third participation ($p<.05$). The model predicted an improvement of 10.36 percentage points on the exams with full participation in the study sessions as compared to no participation. **Conclusions:** Partaking in the SI sessions seems to improve exam scores. Furthermore, higher degree of participation, seems to be associated with greater improvement on the scores. Further studies in different classes and larger sample size are needed to assess generalizability of these findings.

**Impact of Transition from In-Person to Remote OSCE Format on Internal Medicine Elective Student Performance**

Jaclyn D. Cole, *University of South Florida Taneja College of Pharmacy*, Melissa J. Ruble, *University of South Florida Taneja College of Pharmacy*.

**Objective:** To determine the impact of emergent transition from in-person to remote learning on student performance within real time objective structured clinical examinations (OSCEs). **Methods:** In response to COVID-19, University mandate required transition of in-person didactic courses to remote learning in the 2020 Spring semester. The PY3 Internal Medicine elective had six remaining weekly OSCEs, accounting for 55% of course grades. All other graded activities had occurred in the classroom. Full credit was awarded for the first OSCE as students familiarized themselves with the new virtual format. The primary outcome of this study was the overall average OSCE performance for the course for the remaining five virtual simulations compared to the in-person offering in 2019. Secondary outcomes included individual OSCE performance, OSCE performance with inclusion of the first OSCE, and overall course grades. **Results:** There were no statistically significant differences in overall average OSCE performance between 2019 ($n=20$) and 2020 ($n=20$) cohorts for the five simulations (91.1% vs. 86.7%, $p=.199$). Secondary outcomes showed statistically significant differences favoring performance in the 2020 cohort for Infectious Diseases (78.3% vs. 89.4%, $p<.001$) and Anticoagulation (74.4% vs. 91%, $p=.002$), while Cardiology favored the 2019 cohort (91.1% vs. 82.8%, $p=.028$). There was no statistically significant difference in performance on the Cumulative I (86.1% vs. 82.2%, $p=.413$) or Cumulative II (83.3% vs. 89.4%, $p=.285$) simulations or in final overall course grades (86.6% vs. 90.2%, $p=.064$). **Conclusions:** An emergent transition to remote learning may not negatively impact student performance on real time OSCE activities.

**Impact of Two Methods for Assigning Groups in a Team-Based Learning Self-Care Pharmacotherapy Course**


**Objective:** To assess the impact of team formation strategies on team performance and student perceptions of team dynamics in a semester-long, modified team-based learning self-care pharmacotherapy course. **Methods:** In 2018, student teams were intentionally formed, primarily based on equal distribution of community pharmacy experience and avoidance of significant relationships. In 2019, team
assignments were randomized. Grade performance on team readiness assessment tests (TRATs) was compared between the two cohorts for all students enrolled. Students were also surveyed at course conclusion to evaluate their perceptions regarding team dynamics. Results: Average TRAT scores in 2018 and 2019 were 99.8% (n = 91) and 99.9% (n = 68), respectively, resulting in no significant difference in TRAT scores (p = .331). Questionnaire response rates were 85.7% (n = 78) for the intentional cohort in 2018 and 77.9% (n = 53) for the randomized cohort in 2019. No significant differences were noted between cohorts for any of the questionnaire items evaluating student perceptions, including team members participating at an acceptable level, communicating well, and supporting each other. Conclusions: Intentionally forming teams based on distributing community pharmacy experience and avoiding significant relationships did not result in significant differences in team performance or student perceptions of team dynamics compared to randomization for this course. For semester-long teams, randomization may be an efficient way of assigning students to teams without negatively impacting team performance or student perceptions.

Implementing an Online Faculty Development Primer to Orient Non-Pharmacist Colleagues to Contemporary Pharmacy Practice

Angela C. Dominelli, Albany College of Pharmacy and Health Sciences.

Objective: The Accreditation Council for Pharmacy Education Standards state that “faculty members, regardless of their discipline, have a conceptual understanding of and commitment to advancing current and proposed future pharmacy practice”. To meet this need at our institution, our overarching purpose was to develop and implement a comprehensive faculty/staff development program designed to orient non-pharmacist colleagues to contemporary pharmacy practice. More specifically, we aimed to provide a flexible online program designed to facilitate career growth and enrich each participant’s interfacing with students and colleagues in the pharmacy program. Methods: We created an online, self-paced Pharmacy Practice “Primer” for enrollees to complete over a two-month period, with an expected time commitment of 4-6 hours. The Primer engaged the learners through instructional methods including faculty and P4 student-narrated slides and videos, literature, websites/videos, and four critical reflection assignments; topics included Snapshot of Contemporary pharmacy; Career Exploration; CAPE Outcomes; APPE and licensure requirements; Professional Identity Formation/co-curriculum; interprofessional education; emerging trends. Results: For fall 2020, seven of 24 (29%) of faculty/staff enrollees completed the course. Time to complete the primer may have influenced completion rate. Primer faculty evaluated reflections by rubric. The innovation was tested by employing a 10-item Pre- and Post-Outcomes Assessment Survey to gauge familiarity with pharmacy practice topics at baseline, and after completing the Primer, in which growth was evidenced in all questions posed. Conclusions: This first iteration of the Primer proved successful in orienting 7 non-pharmacist colleagues to contemporary pharmacy, and thus will be offered annually, each fall. To improve completion rate in future offerings, college administration will intervene. Our innovation can be easily transferred to other institutions who could adopt (or adapt) our format for their use.

Implementation of Music Video Reflections within a Communications Course and Evaluation of Student Empathy Development

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Objective: The use of the arts has proven to be an effective tool in empathy development but not extensively studied within pharmacy education. The objective of this study was to evaluate a music video intervention within a required pharmacy communications course and the impact on empathy development. Methods: First year pharmacy students were randomized into either the control group or the music intervention group where students watched and reflected on a music video related to course content for a total of 5 weeks. All students completed a pre and post test including an attitudes and perceptions survey and the self-reported Kiersma-Chen Empathy Scale (KCES). Students were then evaluated by faculty on their empathy within a pharmacist-patient simulation. Results: In total, 184 students completed this study. At the completion of the study, students within the music intervention group had significantly higher KCES total scores versus the control group (p < .01). Students’ self-reported ability to relate to both pain and addiction was also significantly higher within the music intervention group (p < .01). The faculty assessed student empathy score during the pharmacist-patient simulation showed a higher mean score within the music intervention group versus the control group, however, no statistically significant difference (p = .192). Conclusions: The use of music videos proved to be an effective tool in increasing students’ self-reported empathy and in enhancing their ability to relate to the patient experience as it relates to pain and addiction. Further research is needed to explore ways in which empathy...
development can be achieved with the use of arts and how it can translate to the provision of patient care.

Implicit Bias Workshop Impact on Pharmacy Student Perceptions of Individual and Social Determinants of Health

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Objective: Study objectives were to characterize student perceptions of individual characteristics and social determinants of health (SDOH) on patient preferences/access to care and confidence caring for diverse populations. Methods: A retrospective study was conducted among third-year (P3) Doctor of Pharmacy students participating in a required implicit bias workshop that included a 1-hour lecture, 2 hours of patient case discussions, and pre/post-workshop online surveys. Wilcoxon rank sign test was performed to evaluate pre/post survey responses, with p<.05 considered statistically significant. Results: Sixty-five students (98.5%) completed the pre/post surveys. Perception of factors to evaluate in most to all patients significantly increased post-workshop for religious beliefs (+29.2%), sexual orientation (+21.5%), gender identity (+20%), and physical/mental disabilities (+18.5%), p<.05. Perceptions regarding race/ethnicity/cultural background (+13.9%) and socioeconomic status (+13.9%) were not significantly different. Students felt confident caring for patients with different individual characteristics and SDOH (86-100% strongly agreed/agreed pre-workshop vs. 87.7-100% post-workshop, p>.05). Reported personal or observed instances of implicit bias included: race/ethnicity/cultural background (79%), socioeconomic (70%), physical/mental disability (56%), gender identity 39%, sexual orientation (33%), religious beliefs (33%). Students strongly agreed/agreed the workshop was relevant (95%), helpful (94%), and provided applicable learning points for their future practice (97%). Conclusions: A 3-hour implicit bias workshop increased P3 student perceptions of individual patient characteristics and SDOH to evaluate in most to all patients. Although students reported high confidence levels caring for patients with different characteristics, over 90% felt the workshop was relevant, helpful, and provided applicable learning for their future practice. This study suggests that a one-time workshop can impact student perceptions about patient characteristics, SDOH, and provide valued skills. Other schools with impacted curricula may benefit from this educational strategy.

Improved Student Learning of Critical Care Therapeutics with a Novel Peer Instruction Model

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Objective: To assess the effect of peer instruction on mean exam scores during an abbreviated offering of a critical care course. We hypothesized that peer instruction would improve student comprehension. Methods: At St. Louis College of Pharmacy, critical care content was initially delivered to third-year pharmacy students with a combination of didactic lectures and large group discussions. An abbreviated course was offered in the summer for students who failed the initial offering of the course. Teaching methods were amended to include peer instruction in an effort to improve understanding of core content. Two exams were administered in each course. Learning objectives assessed on the first and second exam were constant in both instances of the course. Paired t-tests were used to analyze differences in mean exam scores between each course. A two-sample t-test analyzed differences in mean change in exam scores. All data was collected and analyzed in Microsoft Excel 2016 software. Results: Seven students failed the first critical care course and a comprehensive remediation exam and were enrolled in the abbreviated course. Mean exam scores were significantly better with peer instruction than the traditional course offering (81.5% vs. 63.5%, p<.0001). Mean scores significantly improved on exam one (59.7% vs. 84.5%, p<.01) and exam two (68.7% vs. 77.7%, p=.02) after students participated in peer instruction. The mean change in exam score was significantly greater for exam one compared to exam two (+24.9% vs. +9.0%, p=.02). Conclusions: Peer instruction improved mean exam scores for students completing remediation of a critical care course. Exam score improvement occurred for each exam but was more pronounced for exam one than exam two.

Incorporating Interprofessional Education IPEC Competencies into a Required Introductory Pharmacy and Nursing Didactic Course

Nicole S. Culhane, Notre Dame of Maryland University, Sherry L. Moore, Notre Dame of Maryland University, Jonathan Thigpen, Samford University.

Objective: Enhancing the proficiency of students to become competent members of an IPE team requires focused experiential and didactic activities. The School of Pharmacy and
the School of Nursing provided two combined IPE classes annually (2017-2019) for first year students with the intent of increasing skills in IPEC Core Competencies 3 (Interprofessional Communication) and 4 (Teams and Teamwork).

**Methods:** Classes consisted of active learning exercises with supplemental lecture, challenging students to work together to find optimal solutions to problems. Time was allotted for debriefing and discussion. Students completed a post-session reflection with six guided questions to collect qualitative themes. Participants also completed the W(e) Learn Interprofessional Program Assessment Scale, a survey designed to assess student perceptions of the structure, content, service, and outcomes of the interprofessional classes. The survey consists of 30 questions on a 7 item Likert scale. A retrospective mixed-methods study was conducted and t-tests were used to compare survey scores between groups. **Results:** A total of 111 students completed the survey (average total score 197.53; SD 15.96). Total scores were not different when comparing pharmacy vs. nursing students ($p = .055$) and students with and without prior work experience ($p = .397$). Students in 2018 did have higher scores than students in 2019 ($p < .001$). Thematic analysis revealed that students recognized that teamwork, mutual respect, effective communication, and understanding the roles and responsibilities of the interprofessional team help to improve patient care ($n = 169$; 115 pharmacy, 54 nursing). **Conclusions:** Incorporating IPE in a didactic course improved student knowledge of IPE competencies, provided necessary tools for interprofessional communication, and established the components of a team-based model for students to succeed in today’s workforce.

**Incorporating Yoga Philosophy and Practice into Curriculum**

Kristine M. Cline, The Ohio State University, Virginia Lemay, The University of Rhode Island, Seena L. Haines, The University of Mississippi, Lauren R. Biehle, University of Wyoming, Shawn R. Taylor, Wingate University.

**Objective:** Explore approaches to incorporate yoga philosophy and practice into PharmD curricula. **Methods:** A working group of faculty compared and contrasted ways that yoga philosophy and practice have been integrated into core curriculum, electives, co-curricular requirements, and voluntary groups at their institutions. Through qualitative analysis of these efforts, a faculty work group described core tenets of strategies and tools to incorporate yoga philosophy and practice. **Results:** There are numerous ways that yoga philosophy and practice may be integrated to support well-being. The three tenets for institutional incorporation can include alignment with institution strategic plan (university, school or unit), building upon existing curricular and programmatic efforts and community engagement. Successful programs have been incorporated across the continuum of PharmD education and training including core curriculum, electives, co-curricular requirements, professional associations, and community engagement. Creating a wellness culture within an institution will be driven by strategic planning, as well as organizational curriculum structure. Where applicable, it is highly beneficial to overlap with existing efforts to best leverage faculty and staff efforts while mitigating additional workload. Lastly, program flexibility is important to be able to quickly adapt to changing needs of students and methods of instruction. This need for flexibility has been highlighted recently with online/hybrid transitions during the COVID19 pandemic. While many of these programs have been designed to address student well-being, they are also equally beneficial to the faculty and staff who engage either directly or indirectly. **Conclusions:** Inclusion of yoga philosophy and practice can provide additional strategies and tools for well-being and resilience. There are many ways to accomplish this incorporation, and it is valuable to create programmatic standardization to synergize institutional efforts and workload for faculty and staff.

**Innovative Teaching Methods During COVID-19: Pre-Recorded Video Lectures Vs. Virtual Case-Based Learning**

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**Objective:** To compare performance, perceptions, and preferences between pre-recorded video lectures and virtual case-based learning in liver pharmacotherapy. **Methods:** This is an IRB-approved prospective observational study. Inclusion criteria second-year Doctor of Pharmacy Students enrolled in the liver pharmacotherapy course in Spring 2021. The two teaching methods utilized were pre-recorded video lectures (AUD=Alcoholic Use Disorder and DILI=Drug-Induced Liver Injury) and virtual case-based learning (ALF=Acute Liver Failure and CLF=Chronic Liver Failure). Prior to class participation students were required to complete the designated activity. The class began with an iRAT (Individual Readiness Assurance Test), followed by post-topic surveys, team-based case discussions, and Kahoot quizzes. The course ended with a post-survey. Data was analyzed using descriptive statistics and t-tests. **Results:** Student performances were measured by comparing the Kahoot quizzes and the final examination scores per topic. Kahoot scores for ALF=60.8% vs AUD=66.7% ($p = .089$); Kahoot scores for CLF=45.4%
vs DILI = 55.8% (p < .00001). Final exam scores for ALF = 74.6% vs AUD = 83.5% (p < .00001); final exam scores for CLF = 79.0% vs DILI = 84.5% (p < .00001). The average time to complete the pre-course activity for ALF, CLF, AUD, & DILI was 79, 130, 128 & 106 minutes, respectively. Students’ perceptions of usefulness, understanding, time/flexibility, self-directed learning, ease of use, and clarity of instructions ranked on an average ALF (> 3.7/5), AUD (> 3.6/5), CLF (> 3.0/5) & DILI (> 3.8/5). Students preferred a combination of pre-recorded video, virtual case-based learning, and in-class lecture (46%) over individualized methods. Conclusions: Students’ performance significantly differs between pre-recorded video lectures and virtual case-based learning depending on the difficulty of the pharmacotherapy topics, such as CLF vs. DILI. A combination of different modes of teaching is preferred over a single method.

Integrating Referrals and Adverse Effects into Suicide Prevention Gatekeeper Training

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Objective: The Joint Commission and ASHP recognize pharmacists’ as suicide prevention gatekeepers, yet pharmacists need referral resources and may question relevance to practice. Our objective was to integrate into gatekeeper training (1) national, free 24/7 Crisis Line, and (2) a Jeopardy game of medications with suicide risk. Methods: Peer-reviewed literature, clinical references and Crisis Line materials were used to develop the trainings. P2 and P3 students from 2 schools synchronously trained in September 2020. Exercises were integrated into 75-minute gatekeeper training including warning signs, asking about suicidal ideation, validating feelings and expediting referral. Pre- and post-training, students responded to a survey and to role-play as a pharmacist to a video presentation of a patient expressing warning signs of suicide in a community pharmacy setting. Pre-post changes in knowledge, attitudes and self-efficacy were assessed with paired Wilcoxon ranked sum tests or chi-square tests.

Results: After training, students who correctly identified the number of medications labelled for suicide risk increased from 21% (n = 22) to 80% (n = 82, p < .05). The number who correctly answered that asking about suicide does not increase risk rose from 47% (n = 48) to 90% (n = 92; p0.001). Crisis Line referrals also increased from 39% (n = 35) to 94% (n = 85; p < .01). However, students still reported discomfort with asking the patient about suicide.

Conclusions: New short exercises to refer to the Crisis Line and to play medication Jeopardy specific to suicide risk increased students’ recommendations to refer to the crisis line in video role-play and their recognition that more than 140 medications are labelled for suicide risk. Future interventions should focus on ways to improve self-efficacy to ask about suicide and integrate Crisis Line referrals into community pharmacy workflows and training.

Integration of Substance Use Disorder Content into Ohio Pharmacy School Curricula

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Objective: Given the rise of drug overdose deaths in recent years and the resurgence of deaths during COVID-19, Ohio has implemented multiple strategies to address substance use disorder (SUD). Healthcare professionals, including pharmacists, are key individuals who should be prepared to address and prevent SUD. However, little is known regarding integration into pharmacy curricula. Thus, the objective of this project was to assess the integration of pain management, SUD, and adverse childhood experiences (ACE) in Ohio pharmacy school curricula. Methods: The Ohio Attorney General Scientific Committee on Opioid Prevention and Education (SCOPE) educational subcommittee created, pre-tested, and distributed a close-ended survey to all seven Ohio pharmacy school deans via Qualtrics. Deans were asked to have the appropriate individual within the school complete the survey. Email and phone call reminders were utilized to improve the response rate. Data were analyzed descriptively using SPSS. Results: All seven schools of pharmacy participated (100% response rate). All schools covered mechanisms of pain and pain scales, and there was a moderate extent of education given regarding pharmacologic and non-pharmacologic therapies for pain. Most schools covered SUD biology, DSM-5 criteria, and patient-centered communication strategies. Ethics, as well as social determinants of health factors that influence pain and SUD, are covered less often, and ACE was only covered by one school. Conclusions: Pharmacy schools consistently covered many areas of pain and SUD but could expand, particularly related to patient factors and ACE. Identifying ways to expand and address these aspects could
help prepare students to work with patients to address pain and SUD.

International Advanced Pharmacy Practice Experiences: Positive or Negative Impact on Residency Applications?

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Objective: As of 2016, at least two-thirds of colleges of pharmacy offer international Advanced Pharmacy Practice Experiences (APPE) in more than 67 countries. With these opportunities being open to more students, there are likely an increasing number of international experiences being included within residency applications. The objective of this study was to determine residency program directors' perceived value of international experiences. Methods: An anonymous 22 question Qualtrics survey was sent to all residency directors listed within the ASHP residency directory from October 2020 - January 2021 with reminder emails sent every month to non-respondents. Descriptive statistics were completed to identify the demographics of the residency directors and their perception of international APPEs compared to other APPEs. Purdue University IRB approved this study. Results: There were 198 (15%) residency directors that responded to the survey. The majority of respondents (95%) were Post Graduate Year 1 (PGY1) directors. Fifty-five percent of directors had been in their roles 5 years or less and 45% for more than 5 years. Only 37 (19%) had completed a non-vacation international experience as a student (49%), resident/fellow (1%), or practicing pharmacist (33%); several did not report when their experience occurred. Overall, the respondents viewed international APPEs as “neutral” (60%) or “positive” (39%) relative to other APPEs. Conclusions: The data reveals residency program directors find, at least the same, if not at times more value to international APPEs than other APPEs. Future directions with this data include investigating how residency directors view recommendation letters from international preceptors and providing more widespread education regarding the knowledge, skills and attitudes developed on international APPEs.

Introduction to Top Prescription Drugs, Nonprescription Medications, Calculations, and Medical Terminology Through an Interactive Activity

Kaelen Duncan, MCPHS University Worcester/Manchester, Aimee Dawson, MCPHS University Worcester/Manchester, Cheryl Abel, MCPHS University – Worcester/Manchester.

Objective: To describe an introductory, in-class, team-based “pharmacy foundations activity” that incorporates the top prescription drugs, nonprescription medications, calculations, and medical terminology. Methods: In an effort to introduce and provide context for learning “Pharmacy Foundations” (the top 200 drugs, common non-prescription medications, pharmacy calculations, and medical terminology), team-based learning activities were incorporated in a required first year patient care course series. Students were provided patient cases that incorporate the Pharmacy Foundations and a worksheet to assist in analyzing the cases. Students worked in small teams to complete the worksheet and then responses were discussed as a large class. The activity culminated with an individual assessment administered via ExamSoft. Students were permitted to use their worksheets during the assessment. This activity is further developed in the subsequent semester to reinforce these concepts and incorporate additional foundations such as lab values. An anonymous course evaluation was delivered at the end of the first semester. Results: A total of 188 students were enrolled in the first semester; the second semester is ongoing. Assessment scores showed an average grade of 88.28% with the median grade of 90%. Course evaluations were overall positive (response rate: 75%); 95% (n=134) of respondents agreed or strongly agreed with the statement “The structure of this course helped me learn the material.” Qualitative comments were positive with one student writing: “I absolutely love the in class ‘workshops’ prior to assessments. [it] is super helpful in the application process.” Conclusions: These activities introduced and provided context for top prescription drugs, nonprescription medications, calculations, and medical terminology which are traditionally memorized early in the curriculum. High assessment scores and positive course evaluations suggest that the in-class team-based activities were effective.

Involving Students in IPE Planning: An Unexpected Initiative Advances Innovative Interprofessional Collaboration

Sarah McBane, University of California, Irvine, Theodore Gideonse, University of California, Irvine, Jan Hirsch, University of California, Irvine.

Objective: Describe an unexpected initiative involving students that advanced IPE planning between public health and pharmacy students. Methods: Two pharmacist faculty members precepted three public health students in their required senior practicum during the Spring 2020 academic
quarter. Key practicum activities included a literature review and developing a proposal for IPE didactic and experiential activities between the two schools. The students spent 10 hours per week on practicum activities including a weekly one-hour meeting with their preceptors. The practicum culminated in a written report and accompanying presentation to public health and pharmacy faculty. Results: The students’ literature review revealed few publications explicitly describing IPE between public health and pharmacy students. The students incorporated knowledge of their own public health curriculum with insight from the pharmacy faculty to create a short-term IPE plan that included concomitant pharmacy/public health student enrollment in up to five existing didactic courses and participation in an existing public health pandemic simulation activity. Their long-term plan included participation in HIV patient simulations, research projects, and student-run clinics or health fairs. Public health and pharmacy faculty are now utilizing the students’ proposals as a tangible basis of discussions to build the IPE program between the two schools, while also including nursing and medical students Conclusions: Involving students in IPE planning resulted in actionable, student-friendly proposals to support faculty in in advancing innovative interprofessional collaboration.

Mentoring Factors Associated with Resident Lecture Performance in a Teaching and Learning Certificate Program
Krista L. Donohoe, Virginia Commonwealth University, Rotana M. Radwan, Virginia Commonwealth University, Leigh Anne Hylton Gravatt, Virginia Commonwealth University, Teresa M. Salgado, Virginia Commonwealth University, Rachel W. Flurie, Virginia Commonwealth University.

Objective: To determine the factors associated with a resident’s self-evaluation of their lecture performance in a Teaching and Learning Certificate (TLC) program with regards to mentorship at the Virginia Commonwealth University (VCU). Methods: An anonymous survey was emailed to 46 residents who completed VCU’s TLC during the 2018-2019 and 2019-2020 school years. The survey assessed residents’ self-perceived lecture performance and asked detailed questions about the role of the mentor in delivery of this lecture. Data were summarized with descriptive statistics. Fisher’s exact tests were conducted to investigate the association between resident’s self-perceived lecture performance and: mentor’s involvement, resident’s confidence in understanding the lecture topic, mentor’s affiliation with VCU, and semester when the lecture occurred. Results: Forty-two of the 46 residents (91% response rate) completed the survey, with 33 analyzed based on delivering lectures at VCU. Perception that mentorship received enhanced their lecture significantly varied according to mentors’ involvement ($p<.0081$). All respondents with “sufficiently/very/extremely” involved mentors agreed that mentorship enhanced their lecture, while 63.6% of those who perceived their mentors to be “slightly/not at all” involved agreed that their lecture had been enhanced due to their mentor efforts. No significant differences were identified in the proportion of residents who agreed that mentorship enhanced their lecture with mentor’s affiliation (VCU or non-VCU) and semester in which the lecture was delivered. Conclusions: Active mentorship was associated with an increase in resident self-perceived performance. The best criteria for lecture mentorship should be established in the future to help prepare residents for their lectures.

Mindset Comparison on Student Performance in a Pharmaceutical Calculations Course
Emily Eddy, Ohio Northern University, Karen Kier, Ohio Northern University, Jennifer Grundey, Ohio Northern University, Jessica Hinson, Ohio Northern University, Andrew Roecker, Ohio Northern University, Kyle Parker, Ohio Northern University.

Objective: Determine the importance of growth and math mindset on performance in a required pharmaceutical calculations course. Methods: A survey evaluated growth and math mindsets in a second-year course of a 0-6 program. The questions evaluated growth mindset and confidence toward mathematics. Students completed a comprehensive mathematics exam that required a 70% to pass the course. Scores on the math final and course grade were compared to determine the relationship between growth or math mindsets and performance. Logistic regression was performed to determine if math exam scores could be predicted from growth and math mindsets. Chi-square was used to compare passing versus failing the math exam in relationship to mindset. Results: Eighty-six percent had a growth mindset. Only 15% of students self-reported a math mindset. Fewer students were confident in their math ability. A growth mindset did not correlate to success on the math exam or final grade. There was a correlation between a positive math mindset and performance on a comprehensive exam and final grade ($R^2=0.879$). Chi-square analysis showed a difference with passing the math exam when their math mindset was that math was difficult for them ($p=.012$) and they felt they did not have a math mindset ($p=.033$). The growth mindset was statistically significant for one can change their intelligence ($p=.024$). Conclusions: Overall growth mindset did not correlate with course performance. Students who entered the course with a lesser math mindset were more likely to score lower on a comprehensive calculations
exam. Assessment of the math mindset could be an early indicator of poor performance in future courses and allow for interventions to improve performance.

**Mixed Methods Analysis of Real Patient Case Presentations in the Virtual Environment**

Jeremy S. Stultz, The University of Tennessee, Leslie Hamilton, The University of Tennessee, Kenneth Hohmeier, The University of Tennessee, Andrea S. Franks, The University of Tennessee.

**Objective:** To compare learning outcomes in patient case presentations between a live (2019) and virtual (2020) format and identify factors associated with student performance. **Methods:** In 2019 during a semester-long course, students learned how to extract and assimilate information from real patient cases and write/present pharmacist care plans. Mid-semester 2020, all presentations switched to virtual and most sites where students collected case information from electronic health records (EHR) changed to distribution of modified/abbreviated cases without EHR use. Presentations were evaluated using a rubric based on the pharmacist patient care process (PPCP). Two-way repeated measures analysis of variance and multivariable logistic regression assessed our outcomes quantitatively. Student and preceptor focus groups were held to characterize perceptions of the presentation format change. **Results:** Among 165 students presenting cases live and 194 virtually, case presentation scores significantly increased from the first to fifth presentation both semesters (p<.001) and did not differ between semesters (p=.979). Students described their learning in a virtual format as the same or less, while preceptors felt that learning was increased with live presentations. In the virtual semester, but not the live semester, EHR use for at least one presentation was independently associated with the same or improved presentation scores over the semester (OR 3.6, 95% CI 1.3-10.4, p=.016). Students and preceptors described the changed case distribution as more efficient and focused, but felt students did not gain experience collecting and distilling pertinent data from the EHR. **Conclusions:** While student and preceptor perceptions of learning varied, student performance overall improved whether a case presentation course was delivered live or virtually. Student use of an EHR in a case presentation course may be associated with development of PPCP related skills.

**Multi-school Assessment of Student Pharmacists’ Knowledge and Perceptions of Telehealth**

Andrea L. Porter, University of Wisconsin-Madison, Jeanne Frenzel, North Dakota State University.

**Objective:** To assess student pharmacists’ knowledge and perceptions of telepharmacy and telehealth and intent to provide remote services in practice. **Methods:** Students at two universities completed a telepharmacy/telehealth module consisting of readings, videos, and a pre-recorded discussion. Students also completed an activity reflection and post-survey. The survey had 26 items and consisted of two parts. Part one measured students’ knowledge of telepharmacy and telehealth (9 items). Part two measured students’ intention to provide telepharmacy and telehealth services to underserved areas (17 items). Descriptive statistics and thematic analysis were completed on the data. **Results:** A total of 295 students participated in the study (N=99 North Dakota; N=196 Wisconsin). Students’ mean overall knowledge percent score was 94.84% (SD=9.05). Students’ mean scores on the intent to provide telepharmacy and telehealth services survey for each subscale were attitude (M=3.25; SD=0.41), subjective norm (3.07; SD=0.43), behavioral control (M=2.67; SD=0.41), and intent (M=2.62; SD=0.59). Students described similarities of telehealth to in-person patient care as synchronous in delivery and similar content and quality. Differences included the use of technology and difficulty in building relationships through telehealth and in observing body language. Students thought telehealth would be expanded in the next 5 years due to access, convenience, and cost. **Conclusions:** Students were knowledgeable about telehealth and telepharmacy. Students agreed that remote services positively impact patient care and would be well-received by patients and providers. Students were less likely to believe that they had control over their ability to offer remote services and had lower intent to offer remote services upon graduation. Simulations and service management information should be added to curricula to prepare students for and further develop student interest in telepharmacy and telehealth.

**Pandemic Persistence: Pivoting Perceptions of Online Teaching and Assessment Among Faculty**

Adam B. Woolley, Northeastern University, Danielle M. Miller, Northeastern University, Michael J. Gonyea, Northeastern University.

**Objective:** Examine faculty comfort and perceived barriers resulting from the shift to remote teaching and learning due to the pandemic, and garner insight into specific course areas which omitted or taught in a limited capacity resulting from COVID-19 induced adaptations. **Methods:** In the spring, summer and fall semesters of 2020, an online survey was distributed to faculty. The survey consisted of questions ranging from self-assessment of comfort, barriers and plans for teaching in the online learning environment. COVID-19 impact on course delivery, function, learning and faculty
experience were also collected. **Results:** Survey responses ranged 53-77% (overall: 43% female, 59% pharmacy practice), with 77% comfortable with online teaching and learning. Course delivery: synchronous online (13 (25.5%)), asynchronous online (13 (25.5%)), synchronous on-ground (1 (2%)), and hybrid (24 (47%)) using a variety of platforms. Assessment strategies revealed 17/27 (63%) mixed formative/summative assessments utilizing Canvas, ExamSoft and other platforms, with most faculty utilizing Canvas (59%). Approaches to ensuring academic integrity included honor code usage, increased essay questions, oral exams, remote proctoring and shortened assessment time. Faculty stated attainment in material coverage and meeting course goals/objectives in summer (19 (100%) didactic, 9 (78%) experiential) and fall (22 (100%) didactic, 14 (93%) experiential), but some student-healthcare team interaction challenges on APPEs were identified. **Conclusions:** Faculty faced unprecedented pedagogical challenges due to the COVID-19 pandemic. Most faculty felt comfortable in the online learning environment and implemented appropriate teaching and assessment strategies. Course objectives and attainment of skills were met in most courses, with more challenges in skills labs and on APPEs. These findings support improved and resilient models of effective teaching and learning for the future.

**Parsing the Pandemonium: An Analysis of Student Perceptions of Online Teaching and Learning**

Danielle M. Miller, Northeastern University; Adam B. Woolley, Northeastern University, Michael J. Gonyeau, Northeastern University.

**Objective:** Examine student comfort and perceived barriers to online teaching and learning resulting from the shift to remote learning during the COVID-19 pandemic. **Methods:** In the spring and fall semesters of 2020, an anonymous online survey was distributed to professional year one through year three students (P1-P3). The survey contained questions ranging from self-assessment of comfort and barriers with the didactic online learning environment, impact on course delivery, function, learning and student experience. All spring responses were analyzed, and based on students’ experiential learning schedule, longitudinal perceptions were analyzed in both semesters. This evaluation was deemed IRB exempt. **Results:** Overall, 100 students (P1 33%, P2 46%, P3 21%) completed the survey in the spring and 147 (P1 48.3%, P3 51.7%) completed the survey in the fall (69.6% overall response rate). Student identified barriers included lack of student-faculty relationship (spring=80.9%, fall=81.6% A/SA), lack of social interaction in class (spring=61.9%, fall=76.2% A/SA), impersonal nature (spring=69%, fall=61.2%), and time management concerns (spring=64.2%, fall=43.54%). Students were comfortable completing online assignments (spring=81.7%, fall=68.7%), receiving feedback remotely (spring=75%, fall=76.2%), engaging in discussion boards (spring=75%, fall=70.8%) and ensuring academic integrity (spring=76.7%, fall=79.6%). Over time, student perceptions remained consistent across most questions. Notable changes over time included a decrease in time management concerns, an increase in the lack of social interactions, and decreased comfort submitting online assignments. **Conclusions:** Most students felt online learning was impersonal and lacked essential peer and faculty relationships, and required better time management skills. Students were apathetic about potential academic integrity issues. Results were useful in tailoring online teaching and learning experiences and resulted in modifications to course policies and procedures, as well as redefining student expectations during the COVID-19 pandemic.

**Patient Presentation to a Pharmacy Preceptor Survey: An Exploratory Factor Analysis**


**Objective:** An exploratory factor analysis (EFA) was conducted for a survey which assessed a student’s confidence in their ability to identify and resolve drug-related problems for a case and verbally present the patient to a pharmacist preceptor in an organized, efficient, and coherent manner. The goal of EFA was to generate a refined and concise survey instrument intended to effectively capture student responses. **Methods:** To assess the validity of the survey instrument (34-items), EFA was performed on the student data to refine the instrument and examine the underlying constructs that influence student responses on 6 measured variables (collect, assess, plan, monitor, communicate and professionalism). After conducting EFA, the faculty met to gain consensus on items to be eliminated or included in the final survey based on theoretical reasoning and to appropriately title final constructs. **Results:** EFA factor loadings identified a 4-factor solution suggesting elimination of 18 items. Team discussions led to eliminating 13 items, revising 7 items and generation of 1 new item in order to retain important concepts. The outcome was a well-conceptualized and refined 22-item survey model assessing student confidence within 4 constructs: collect, communicate, care plan and collaborate. **Conclusions:** To identify areas for student improvement in the skill of presenting a patient to a pharmacist preceptor and improve students’
ability to comprehend and communicate drug-related information effectively, it is critical to use well-conceptualized survey instruments like the Patient Presentation to a Pharmacy Preceptor survey.

Pedagogical Techniques and Assessment Strategies in a New Pharmacogenomics Elective

Jason Guy, University of Findlay, Julie H. Oestreich, University of Findlay.

Objective: Describe how the integration of hands-on activities such as gaming, business plans, and lab training affected student engagement and perceptions of a pharmacogenomics elective. Methods: A new pharmacogenomics course was offered in the Fall of 2019 at The University of Findlay College of Pharmacy. The course incorporated various techniques to evaluate and engage students with pharmacogenomics content. Some of these strategies included gaming for content review and assessment, incorporation of a business plan to facilitate critical review of potential clinical applications, and the inclusion of a lab component where students participated in the process of genotyping their own DNA. These approaches expanded upon previous strategies reported in the literature. We implemented a novel game focused on clinical scenarios and teamwork. Additionally, anonymized personal genotyping allowed for partial hands on training with DNA isolation and genotyping beyond just analyzing results from a report. Students were surveyed at the beginning and end of the semester to assess their learning and collect feedback on the course. Results: Survey results collectively suggest that students enjoyed the various pedagogical techniques and appreciated the dynamic nature of the course. Many comments highlighted the active-learning strategies and how they helped engage students with course material. Students also rated the course highly on the survey questions related to course content and objectives. Additionally, many students who participated in the elective course signed up for further independent study and research courses based on their pharmacogenomic interests and application to future careers. Conclusions: Incorporation of gaming and other applied activities helped improve student engagement in a pharmacogenomics elective and overall course feedback.

Peer-to-Peer Interactions to Increase Student Engagement in Online P1 Foundations of Pharmacy Course

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Objective: Peer-to-peer interactions play an invaluable role in increasing student engagement, participation, and inclusivity within a didactic course, especially in the online environment. We describe innovative and varied instructional efforts aimed at engaging peers in a required P1 Foundations of Pharmacy (FoP) online course. Methods: Synchronous online breakout groups were utilized via Zoom, for Motivational Interviewing Script Writing (groups of 4); and Inter-professional Education Health Professions Roles & Responsibilities Research (groups of 12), using five-minute videos for 12 health professions prepared by former FoP students to serve as instructional materials. Asynchronous group work included pairs of students to role play both pharmacist and patient and videorecord a motivational interview, and Pharmacy Career Exploration discussion boards (groups of 12), requiring initial and response to peer video posts. All group work was uploaded into Canvas and rubric-graded by faculty. Finally, a P4 APPE student recorded a presentation for asynchronous online delivery (topic Implicit Bias), coupled with an ungraded pre-post assessment quiz to gauge the student learning. Results: All 130 students in FoP course participated in peer-peer instructional activities. For faculty-graded exercises, students met assignment objectives, averaging > 90% on rubric assessments. Commonly, students would mention/thank another student for their presentation, stating how much they learned. Likewise, students demonstrated an increase in learning on 4 of 5 questions on the ungraded pre-post quiz on Implicit Bias. Upon final course evaluation, students noted the value of interacting with/learning from other students, especially in the remote setting of the pandemic. Conclusions: Peer-peer interactions are an essential and valued instructional method to engage students with each other and the course material. We offer many strategies herein for either synchronous or asynchronous online delivery.

Perceived Challenges for Pharmacy Students Learning to Detect Drug-Related Problems in Simulated Electronic Health Records

Russ Palmer, The University of Georgia, Daniel Chastain, The University of Georgia, Christopher Bland, The University of Georgia, Katie Smith, The University of Georgia, Beth Phillips, The University of Georgia.

Objective: To explore what third year pharmacy (P3) students perceived as challenging about detecting drug related-problems (DRP) when working-up patients using a simulated electronic health record in a course focused on
the Pharmacists’ Patient Care Process, and to identify implications for the design of learning environments focused on developing DRP detection skills. **Methods:** An open-ended survey was given to all P3 students (n = 134) to provide in-depth descriptions of what they perceived to be challenging about detecting DRPs when working-up simulated patients. A qualitative approach was used to analyze all responses in a two-cycle inductive coding process to identify themes in the data. 3 themes containing 10 sub-categories were identified. Coding agreement among two independent coders was 97.7%. **Results:** The survey response rate was 90%. The analysis found the following 3 themes and 10 sub-categories. **Theme 1:** Work-Up Process [Rushing/Lack of Time (20), Overlooking Information (9), Forgetting to Complete Routine Actions (16)]; **Theme 2:** Interpreting Cues [Failing to Understand the Relevance of Information (22), Perceived Lack of Experience (21), Information Overload (26), Making Assumptions (7), Too Focused on One Problem to See Others (10)]; and **Theme 3:** Perceived Ambiguity [Encountering Conflicting Information (6), Ambiguity in Defining a DRP (9)]. Results were discussed in terms of Klein’s cognitive model for understanding problem detection through the lens of pattern perception, expectancy generation, and attention management. **Conclusions:** The identification of P3 perceived challenges when learning to detect DRPs contributes to a foundation for considering instructional innovations in this area. Existing literature highlights training approaches such as the “crystal ball” technique and the “Pre Mortem” method as two approaches among others for improving students’ problem detection skills.

**Perspectives of Pharmacists on the Structure, Decision-Making, and Communication Practices of Multidisciplinary Cancer Teams**

Georges Adunlin, Samford University, Moano Gnagnawaka, Samford University, Bolane Bolaji, University of Alabama at Birmingham.

**Objective:** Little is known about the implementation models of cancer multidisciplinary team (MDT) approach within the healthcare system, as well as the tools available to support the collaborative efforts of cancer MDTs within the cancer care settings. This study aims to explore the perspective of pharmacists on the structure, decision-making process, and communication practice of cancer MDTs. **Methods:** A cross-sectional survey was conducted targeting pharmacists practicing across Alabama using a validated questionnaire. The questionnaire includes a section on demographic characteristics and three sections to assess the structure, decision-making process, and communication practices of cancer MDTs. Data were summarized using descriptive statistics. The study was approved by the Institutional Review Board. **Results:** A total of 15 oncology pharmacists completed the survey. More than half of the respondents (53%) reported that treatment-planning meetings were held on a set schedule, patient and/or their caregivers were not invited to participate in MDT meetings. The majority of respondents (67%) indicated that positron emission tomography (PET) computed tomography (CT) was the most common case material or information available at initial case presentations. MDT meetings mostly occurred in person (53%), and physicians (80%) primarily facilitated the meetings. Most of the respondents (67%) indicated that the treating physician was the person in charge of delivering an update to the patient and/or their caregivers after the MDT meetings. About 60% of the respondents strongly agreed that they felt comfortable sharing their opinions with others during MDT meetings. **Conclusions:** This study demonstrated that oncology pharmacists are involved in MDT interventions. The addition of oncology pharmacist to a cancer MDT intervention should be encouraged as health-care systems focus on improving the quality and efficiency of care and patient outcomes.

**Pharmacists’ Perspectives About Spiritual Care**

Paul Gavaza, Loma Linda University School of Pharmacy, Bhaktidevi Rawal, Loma Linda University School of Pharmacy, Elizabeth J. Taylor, Loma Linda University School of Nursing.

**Objective:** No known studies have explored spiritual care within the context of pharmacy practice. The study examined pharmacist perspectives about spiritual care, the frequency with which spiritual care is incorporated in pharmacy practice, and the ways that pharmacists provided spiritual care. **Methods:** Data were collected using a cross-sectional statewide survey. The 57-item questionnaires were mailed to 1,000 randomly selected registered pharmacists in California in 2019. Descriptive statistics, Pearson correlation, independent samples t-test and Chi-square tests were computed to analyze the data. **Results:** Most of the 251 respondents were female (57.5%), worked with terminally ill patients (50.2%), and practiced in urban settings (51.1%) for an average of 23.3 (SD = 14.4) years. Most of the respondents were “somewhat” to “very spiritual” (77.8%) and “somewhat” to “very religious” (64.3%). Most pharmacists believed that faith in God was important to their health (60.5%). Although most (73.4%) respondents agreed they should practice in a spiritually-sensitive manner, 81.4% disagreed or were neutral about “providing spiritual care to patients at work whenever possible.” Few
Pharmacists provided spiritual care services. For example, 66.5% of pharmacists never prayed with a patient, but 28% occasionally prayed privately for patients. The level of spiritual services provided by pharmacists differed by their own spirituality, religiosity, and perception of institutional support ($p<.05$).

**Conclusions**: Although most of the pharmacist respondents were spiritual or religious and believed that spirituality is important for their patients, most perceived that they did not provide spiritual care to their patients. Future research is warranted to examine ethically appropriate strategies for pharmacists to provide spiritual care.

**Pharmacy Practice Section Standing Committees: A 5-Year Review of Faculty Characteristics**

Amy Henneman, Belmont University, Angela Jaglowicz, Idaho State University, Megan Roberts, Samford University, Chrisovalantis Paxos, Northeast Ohio Medical University.

**Objective**: To determine academic appointment characteristics of faculty serving on American Association of Colleges of Pharmacy (AACP) Practice Section standing committees. **Methods**: A retrospective review of available data regarding academic appointments of faculty serving on AACP Pharmacy Practice Section standing committees between 2016 and 2021 was conducted. Characteristics reported include the number of standing committee members each year with an academic rank of assistant, associate, or full professor. Academic appointments of both the chair and vice chair of each committee as well as the number of members with an administrative appointment of Dean, Associate Dean, Chair, Vice Chair, or Director are described. Data were evaluated utilizing descriptive statistics. **Results**: Data from 2016 through 2021 regarding faculty academic rank of members participating in AACP Pharmacy Practice Section standing committees were collected and analyzed. Across all committees, the average number of committee members with a rank of assistant professor was 5.6, associate professor 5.6, and full professor 1.8. The Scholarship/Research Development committee, the Programming committee, and the Faculty Development committee had the highest average number of faculty at the rank of assistant professor, associate professor, and full professor respectively ($n=8$, $n=7$, $n=3.2$). On average, 3 members of each committee (range 1-6) also held administrative appointments. Chairs of committees were more likely to be associate professors followed by assistant and then full professor. **Conclusions**: The results of this review reveal faculty involved within the Pharmacy Practice Section standing committees are more frequently those with assistant or associate professor appointments. The Section should consider ways to ensure standing committees include diverse representation of faculty of various appointments in order to best represent and serve the membership of the Pharmacy Practice Section.

**Pharmacy Students’ Lived Experiences of Academic Difficulty**

Angie N. Choi, University of Arkansas for Medical Sciences, Geoff Curran, University of Arkansas for Medical Sciences.

**Objective**: To understand how students’ lived experiences of academic difficulty in pharmacy college, in relation to Tinto’s conceptual schema of student departure, affects student retention. **Methods**: A descriptive, single, embedded case study design was chosen to explore academic difficulty in pharmacy college, and the unit of analysis (case) in this study was the experience of academic difficulty. Data sources included admissions applications, transcripts, emails to the researchers, and three semi-structured interviews. Prior to analysis, the researchers created a coding dictionary to operationalize codes for textual analysis, and intercoder agreement, evaluated with MAXQDA software, was established at 97% agreement. Research validity was supported by triangulation of data, multiple researchers, and member checking. **Results**: After analyzing the codes in context, seven main themes were identified: 1) student background; 2) goal of becoming a pharmacist; 3) academic integration during pharmacy college; 4) social integration during pharmacy college; 5) retention and departure; 6) roles and responsibilities during pharmacy college; and 7) wellness. Three of the four students were retained due to the synergistic reinforcement of academic and social integration during pharmacy college. A fourth student was academically dismissed and departed the college, suggesting that too many social responsibilities in pharmacy college reduces time for academic integration, thereby diminishing the reciprocal potential between academic and social integration. **Conclusions**: These student stories suggest that early identification of diverse attributes and backgrounds is helpful in improving student retention and success by recognizing the synergistic effect of social and academic integration longitudinally toward the goal commitment of becoming a pharmacist.

**Professional Identity Formation Development in P1 Student Pharmacists: Laying the Groundwork for a Running Start**

Laurie L. Briceland, Albany College of Pharmacy and Health Sciences, Jeffrey Brewer, Albany College of Pharmacy and Health Sciences, Kelly Bach, Albany College of Pharmacy.
Objective: To optimize numerous and varied (co)curricular opportunities, it is imperative to introduce student pharmacists to strategies that develop Professional Identity Formation (PIF) upon P1 matriculation. The aim of this innovation is to describe our efforts in providing a framework that advances PIF in student pharmacists via curricular instruction during first semester P1. Methods: Faculty presented “Laying the PIF Groundwork” to 130 students during P1 Orientation (P1O), immediately preceding the P1 year, accompanied by a brief pre/post assessment. This was followed by a rubric-graded P1O reflection exercise in the P1 Foundations of Pharmacy (FoP) course, which also included instruction on continuous professional development; self-directed lifelong learning; reflection; professionalism; application of co-curriculum in student professional development; and a robust “Careers in Pharmacy” module. Students completed further reflection on pharmacy experts’ pearls of wisdom (using ASHP Letters to Young Pharmacist book), followed by the creation of two Professional Development Goals/Action Plans (for Co-Curriculum, and Pharmacy Career), all as rubric-graded assignments. Faculty Advisors will follow up by reviewing students’ Professional Development Plans in upcoming semesters. Results: Of 110 students who completed the P1O PIF pre/post-assessment survey, students who were somewhat or very familiar about the PIF concept and development strategies offered in the co-curriculum increased from 62% (pre-) to 97% (post-presentation) for PIF concept and from 64% (pre-) to 96% (post-presentation) for co-curriculum strategies. FoP graded reflections (2) and Professional Development Plans (2) constituted 20% of course grade and yielded qualitatively robust professionalization realization and actionable plans. Conclusions: Our educational endeavors successfully introduced and immersed P1 students into PIF developmental strategies using the (co)curriculum, laying groundwork for future discussions with faculty advisors. Our program is easily transferable to other schools of pharmacy.

Proposing an Educational Framework for Healthcare Professionals on Substandard/Falsified Medications and Illegal Online Pharmacies

John Hertig, Butler University, Margo Whitehead, Butler University.

Objective: Currently, there is no standardized curriculum regarding substandard or falsified medications and illegal online pharmacies offered to healthcare providers to combat the problems raised by counterfeits. It is necessary to assess current institutions’ curriculum and to create an educational framework based on subjects deemed vital by those institutions and the researchers. Therefore, the two aims of this study were to: (1) identify gaps and (2) assess various curricular elements best suited to educate healthcare professionals; particularly pharmacists, doctors, and nurses; on how to teach their patients about substandard or falsified medications and online pharmacies. Methods: A mixed methods approach was used for this study. This included (1) an online survey of US Colleges and Schools of Pharmacy using quantitative techniques, (2) as well as utilizing a modified Delphi
Putting the Student in the Patient's Shoes: Using Interactive Group-Based Activities to Increase Student Empathy

Donna M. Adkins, William Carey University School of Pharmacy, Charles R. Breese, William Carey University School of Pharmacy.

Objective: To develop and implement an interactive group-based learning activity to increase student empathy and understanding of compliance issues and co-morbid conditions in patients with type 2 diabetes mellitus (T2DM).

Methods: The Compliance Assignment was designed to allow second year pharmacy students to immerse themselves in the daily management of medication regimens commonly prescribed in T2DM patients. Students received candy “medications” and kept a daily log of adherence to their prescribed medication regimen. During the activity, the student would have medications added, stopped, or changed. Accompanying these changes were assignments associated with co-morbid conditions and the drugs used to manage those conditions. A student was chosen for a pill count of their “medications”, which was matched to their daily log, and if they matched, a class incentive was applied. Reflective essays describing their thoughts and feelings during this activity were collected after completion of the assignment.

Results: The majority of students were non-compliant with some aspect the medication regimen, as reflected on their medication logs. Most students demonstrated an increased level of empathy for non-compliant patients after completing this activity. Students also demonstrated an awareness of the impact their groupmates and incentives had on completing the activity, and an understanding of why patients without incentives and support are likely to be non-compliant. Conclusions: The development of empathy is an important component of communicating with patients and improving medication adherence. After completing this activity, students demonstrated more understanding of the barriers patients face when trying to take medications as prescribed. Including learning activities such as this in the curriculum helps students acquire and demonstrate the knowledge, skills, and attitudes necessary to provide high quality patient care.

PY3 Students' Attitudes to Developing Positive Behaviors via the Tiny Habits Method

Maria D. Kostka-Rokosz, MCPHS University–Boston, Lana Dvorkin Camiel, MCPHS University–Boston, Catherine Taglieri, MCPHS University–Boston, Gary Tataronis, MCPHS University–Boston, Jennifer Goldman, MCPHS University–Boston.

Objective: To examine students’ self-reported successes and obstacles to developing positive behaviors via BJ Fogg’s Tiny Habits method in a large required course.

Methods: Through readings, videos, podcast interviews and peer discussions, students were introduced and, mid-semester, reminded of the Tiny Habits method. Via a multi-step process they identified a positive behavior to incorporate for the duration of semester. At course completion, students were surveyed about successes and obstacles.

Results: Of 233 students enrolled, 215 consented to participation. Major categories of attempted behavioral changes included exercise (17%), sleep (16%), hydration (15%), healthy eating (14%) and life organization (11%). Students incorporated changes in one (34%), two (45%), or three areas (16%) with mean success rate of 62%. Over 77% adjusted their habits over the course of the semester to fit better into their lives and 93% planned to continue with the behavioral modifications after semester completion. The biggest obstacles to success included time constraints (42%) and forgetting about the project (33%). To improve the project in the future, students suggested more check ins (29%), more time discussing habit modification process (22%), more in class time discussing the project in general (19%), pairing students for accountability (16%) and assigning a reflection on the topic (12%). Conclusions: Despite obstacles like time constraints and lower prioritization of the project, students achieved above 60% success in developing new positive behaviors. Most common areas of habit development were related to health/wellness and life organization. Learning how to develop and incorporate positive habits may benefit students in the future during the times of stress.
R-E-F-L-E-C-T! Find Out What It Means to Me: Enhancing Metacognitive and Time Management Skills

Stephanie L. Sibicky, Northeastern University, Alexa A. Carlson, Northeastern University.

Objective: To describe innovative ways of fostering metacognitive and time management skills for advanced pharmacy practice experience (APPE) students. Reflective assignments address Domain 4 (2013 CAPE Outcomes) and the Self-Developer Domain of the Core EPAs for New Pharmacy Graduates. Methods: Multiple reflection methods were implemented on two, six-week, internal medicine APPE rotations. A five-item, written prompted reflection was completed after presentations, a time-tracking project spreadsheet was updated daily, self-evaluations using the APPE evaluation rubric were completed biweekly, “vlogs” describing “Things I learned this week” (#TILTW) in the “Start, Stop, Continue” format were video recorded weekly, and a final #TILTW with advice for future students was filmed at the rotation conclusion. For quality improvement, student evaluations, preceptor evaluations, and student survey responses were analyzed. Results: Mean student scores in the area assessing self-reflection was 5.7/8 (n=58, median=6) and 5.5/8 (n=49, median=5) for preceptor #1 and 2, respectively. Preceptors improved or maintained high scores regarding encouraging self-directed learning, facilitating self-assessment skills, and supporting goal setting and steps to achieve goals (3.81-4/4, n=107). Students commented in faculty evaluations that the spreadsheet “not only prompted self-reflection but also served as a self-directed learning strategy” and helped one “learn to manage my own time and handle multiple tasks”. Students surveyed agreed or strongly agreed that the #TILTW vlogs improved their oral communication by watching their own vlogs and reflecting on their performance (45%, n=11) and time management skills (40%, n=10). Conclusions: Limitations include student evaluations assessing attributes besides self-reflection, so scores may be confounded. A more focused rubric is needed to assess student self-reflection capabilities. However, using free and easily available tools, metacognitive and time management skills can be developed in APPE students.

Relationship Between Student Engagement with Asynchronous Video Lectures and Academic Success

Erica J. Rhein, University of Colorado Anschutz Medical Campus, Paul Reynolds, University of Colorado Anschutz Medical Campus.

Objective: Increasing student engagement with course materials presented asynchronously is an important consideration. Use of technology that increases lecture interactivity can facilitate this engagement and generate student-level analytics regarding interactions with lecture material. This project seeks to examine the association between extent of student engagement with lecture materials and academic performance. Methods: In Spring 2020, all video lectures in an online oncology course were hosted using the educational media platform TechSmith Knowmia (TSK). Students (n=21) were assessed via assignments and 2 exams, each including material from half the course. TSK generates student-level analytics regarding number of times lectures are viewed and the percent completion of each viewing. This lecture engagement by students was compared with academic performance on module assignments, exams, and final course grade via Spearman’s ρ correlation. Results: The median percent of lecture viewing was 105% (IQR 96%). Percentage of lecture viewing did not significantly correlate with performance on course assignments (ρ=0.34, P=.17). Average completion of lecture viewing for modules 1-4 and 5-8 were also not correlated with performance on exam 1 (ρ=0.11, P=.62) or exam 2 (ρ=-0.006, P=.97), respectively. In addition, the average overall percent lecture completion was not correlated with final course grade (ρ=0.01, P=.94). Conclusions: There was no statistically significant correlation between average percent of lecture completion and student performance on module assignments, exams, or final course grade. However, this course ran early in the COVID-19 pandemic, which likely impacted student learning practices. These data are limited by a small student N and single course iteration. Further data are needed to determine if lecture analytics should be used in addition to module assignment and exam grades as early intervention techniques.

Remediation Efforts and the Effect of NAPLEX First-Time Pass Rates

Sean P. Kane, Rosalind Franklin University of Medicine and Science, Karina Luna, Rosalind Franklin University of Medicine and Science, Jerry Jacob, Rosalind Franklin University of Medicine and Science, Danielle M. Candelario, Rosalind Franklin University of Medicine and Science.

Objective: It is not well characterized whether students requiring pharmacy course remediation have a lower NAPLEX pass rate compared to peers who do not remediate at all. The objective of this study was to determine the impact of pharmacy school remediation on NAPLEX success. Methods: Remediation and NAPLEX first-time pass rate data was retrospectively collected for all students who matriculated to a single college of pharmacy between 2011 to 2015. A comparison of the number of remediations
Remote OSCE Experience: What First-Year Pharmacy Students Liked, Learned, and Suggested

Amanda C. Savage, University of North Carolina at Chapel Hill, Jacqueline McLaughlin, University of North Carolina at Chapel Hill, Heidi Anksorus, University of North Carolina at Chapel Hill, Minshew M. Lana, University of North Carolina at Chapel Hill.

Objective: Motivated by the COVID-19 pandemic, schools quickly transitioned teaching and assessment strategies to online formats. The purpose of this study was to explore first year pharmacy student perceptions of a 3-station remote OSCE (rOSCE) administered in Spring 2020. Methods: After completing the rOSCE, students answered three open-text prompts to capture their perceptions: (1) “I liked …”, (2) “I learned …”, and (3) “I suggest …”. Responses were open-coded and frequency counts calculated to determine the most prevalent codes. Concept maps were created to explore code connections. Results: Out of 157 students, 156 students (99.36%) completed the prompts. The three major themes in the Liked data were: Logistics (n=65, 41.7%), Differences In-person Versus Remote (n=59, 37.8%), and Skill Development (n=43, 27.6%). Students discussed the applicability of this experience in developing skills for their future practice. The three major themes in the Learned data were: Technology (n=66, 42.3%), Communication (n=58, 37.2%), and Skill Development (n=56, 35.9%). Skill development responses were categorized as patient care skills (PCS) and non-patient care skills (NPCS). PCS included descriptions of applying the rOSCE experience to providing care to actual patients as a practicing pharmacist. NPCS were primarily related to using technology. The three major themes in the Suggest data were: Logistics (n=89, 57.1%), Technology (n=31, 19.9%), and Continuation of Remote OSCE (n=31, 19.9%). Students recommended continuing rOSCEs within future courses and most students connected continuing the rOSCE to skill development; many students recognized the value in conducting a rOSCE. Conclusions: The rOSCE was well-received and students described it as applicable to their future practice. We recommend incorporating rOSCEs into PharmD curricula as an opportunity to develop skills related to telehealth, which students will experience in practice.

Rural Patient Medication Optimization

Kimberly C. McKeirnan, Washington State University, Megan R. Undeberg, Washington State University.

Objective: To describe the work of a pharmacist-led interprofessional care team in a rural and underserved community. Methods: An ongoing, grant-funded project is being conducted to implement comprehensive medication review (CMR) services in rural and underserved communities. An interprofessional care team comprised of a community pharmacist, a diabetes educator, a home health nurse, and a social worker visit patients in their homes and meet with them in the community clinic to identify and address general health and medication-related problems. Local clinic physicians and nursing staff identify patients and refer them to the project team for an appointment and CMR. Targeted patients included those over the age of 50 taking multiple medications and at high risk for poor health outcomes. This project was reviewed and approved by the Washington State University Institutional Review Board. Results: Twenty-four patients have participated in the project since 2019. Patients had an average of 20 unique medical conditions and were taking an average of 15 medications. As a result of the care team visits, the following interventions were performed: removal of duplications of therapy, adjustments to ineffective medication doses, addition of new medications, coaching on disease-specific dietary adjustments, acquiring new medical devices, and counseling on the importance of medication adherence. These interventions resulted in a 38% decrease in emergency room visits and a 12% decrease in hospitalizations among these patients. Conclusions: This research demonstrates the vital role of the pharmacist in an interprofessional care team supporting medically complex rural patients. With the interventions of the pharmacist, and consistent support of the care team, patients can experience an improved quality of life and reduction in emergency room and hospital visits.
S4A; Preliminary Validation of an Assessment Instrument to Measure ACPE Standard 4


Objective: To be accredited, schools of pharmacy are required to meet the Accreditation Council for Pharmacy Education (ACPE) Standards 2016. The poster describes the development of S4A, a reliable and valid self-report instrument to assess the four affective domains of ACPE Standard 4: Self-Awareness, Leadership, Innovation and Entrepreneurship and Professionalism. Methods: The development and validation of the instrument was conducted in two phases. In Phase 1, assessment items were developed utilizing literature review, a workshop with Pharmacy School faculty, and data from seven structured interviews, including pharmacy school faculty (N=3), preceptors (N=2) and PharmD graduate employers (N=2). Pools of assessment items were developed for P1-P4 students. Assessment items were behavioral, rating the frequency of behavior on a 5-point likert scale. In phase two, items were tested on a sample of 108 students (P1-P3) from one pharmacy school. Analysis was not conducted on P4 student data due to inadequate sample size. The instrument’s statistical reliability was tested using Cronbach’s Alpha and items with poor internal consistency removed. The S4A instrument’s content and construct validity was tested using expert review and correlations with dispositional measures of the four domains, such as the IPIP-50 personality measure and Grant, et al.’s SRIS. Results: All S4A scales (10 items per domain) were shown to be reliable (Cronbach’s α ≥ 0.8) and have strong construct validity. Conclusions: The S4A instrument is a reliable and valid measure of Standard 4 in P1-P3 students and a potentially effective instrument to track progress in the development of skills across Standard 4 domains. Future studies will seek to evaluate the psychometric properties of S4A in other schools of pharmacy and P4 students.

Self-Assessment Rubrics as a Tool to Track Longitudinal Educational Outcome Skill Development

Marie A. Abate, West Virginia University, Matthew Blommel, West Virginia University School of Pharmacy, Krista Capehart, West Virginia University, Mary Euler, West Virginia University, Mary K. Stamatakis, West Virginia University.

Objective: The WVU School of Pharmacy has used portfolios for several years to develop students’ self-assessment skills and track proficiency in five longitudinal outcomes (9 total components): Communication (Written & Verbal)/Cultural Competence, Teamwork and Interprofessional Collaboration, Evidence-Based Practice, Professionalism/Leadership, and Critical Thinking/Problem-Solving. As part of the portfolio, VALUE rubrics (AAC&U) related to each outcome were modified as appropriate and used by students for skill self-assessments twice during the didactic years. The study objective was to determine if students’ self-assessed skills in each outcome improved from their first to second assessment. Methods: Each self-assessment rubric consists of multiple criteria scored on a four-point scale (4=mast...

Student Coping Strategies During the Successful Transfer of Active Learning Instruction to Synchronous Online Format

Dan Cernusca, North Dakota State University, Sanku Mallick, North Dakota State University.

Objective: When faced, due to pandemic restriction, with the choice of a mixed-attendance or fully online option for a pharmaceutics course the instructor worked with an instructional designer and opted for a fully synchronous online option to transfer the benefits of active learning course design. The major objective of this study was to explore students’ use of various coping strategies students used during the online course. Methods: An introductory pharmaceutics course was redesigned prior the pandemic to integrate deep-learning active tasks (productive failure, concept mapping). Active learning tasks were either already virtual (clicker questions) or directly transferable to online synchronous format (breakout rooms). A prior knowledge and an exit survey were used to compare cohorts across semesters pre and during pandemic and gather students’ perceptions, self-efficacy beliefs, and use of coping strategies (planning, growth, and social support for course tasks). Results: We compared Fall 2019 (pre-pandemic) and Fall 2020 cohorts and found no significant differences for prior knowledge ($p=.93$), exams, and self-efficacy ($p$ from .30 to .96). We found a significant lower perception of online course difficulty ($p<.01$). The use of growth and planning coping strategies were rated very high (7 of 9) and correlated. Social support for course tasks was 5.4, slightly above the average, showing a significant positive correlation ($p<.01$) with the perceived course difficulty. Conclusions: We found that highly integrated and targeted active learning tasks effectively transferred to the online synchronous format. These positive results seem to be sustained by students’ high use of planning and growth coping strategies. The use of social support for course tasks signaled higher potential benefits of this type of coping strategies for students that perceived the course difficult.

Student Feedback During COVID19: Considerations for Future Remote Learning Innovations

Michael W. Nagy, Medical College of Wisconsin, Zach Pape, Medical College of Wisconsin, Amber Clemmons, The University of Georgia, Beth Phillips, The University of Georgia.

Objective: To evaluate student perceptions on implementation of a remote learning environment in two distinctive schools of pharmacy to provide insight for ongoing pandemic-related innovative efforts in a partial or full remote learning environment. Methods: This study collected, combined, and evaluated student survey data from courses delivered during the Spring 2020 semester at the University of Georgia (UGA) College of Pharmacy and the Medical College of Wisconsin (MCW) School of Pharmacy. At UGA, students were asked two quantitative questions on a Likert scale for each course and those in a Pharmacotherapy course were asked further quantitative and qualitative questions. At MCW, students were survey at end-of-term with both quantitative via Likert scale and qualitative questions. Responses were reported descriptively as median and interquartile range with further analysis via SPSS software; qualitative comments were analyzed with a content analysis. Results: Despite generally positive student feedback for faculty transition to a remote learning environment and effectiveness of technology in general, students reported several challenges; frequently reported issues were distractions and/or lack of private home learning environment, perception of poor engagement and focus with material remotely, challenges with group work, and concerns for personal mental health. Conversely, students reported some benefits with a remote learning environment such as technology allowing prompt and easy virtual communication in-class and benefits from self-paced materials and lack of commute time. Conclusions: This report details timely quantitative and qualitative student feedback to remote learning environment adaptations. Student feedback, such as that reported herein, should be utilized by faculty to ensure challenges, barriers, and preferences of students are addressed as the remote learning environment persists.
Student Learning Environment Preferences in Pharmacotherapy Course Delivery

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Objective: To assess student attitudes and performance following implementation of hybrid course delivery. Methods: Pharmacotherapy II is offered in the fall semester of the third year and meets for didactic instruction on Mondays, Tuesdays and Wednesdays followed by a recitation period on Fridays. In fall 2019, all classes were held in person and due to COVID-19 restrictions, a hybrid format was adopted in fall 2020 (in person class on Mondays and the other periods were offered only online via Zoom). All classes were recorded in 2019 and 2020. After the fall 2020 semester, students voluntarily completed a survey regarding their learning environment. Finally, cumulative exam scores were compared before and after the learning format change. Results: 61/152 students responded to the survey (40.1%). Students did not prefer one learning format [in-person (34%), online (32%), hybrid (29%)] for didactic instruction. Students preferred asking questions in the online format and the online schedule flexibility, while the in-person format was better for engagement in the course, motivation to attend class, avoiding distractions and emotional health. Students felt all formats were similar for understanding expectations of the course, availability for faculty help, feeling included in the class, collaborating with other students and motivation to do well. Most students agreed or strongly agreed they were satisfied with the online learning format (75%) and the in-person learning format (61%). The mean cumulative exam score in 2019 was similar to 2020 (80.8% vs 81.2%, p = .6) Conclusions: Despite changing to a hybrid learning format, test performance was similar in a Pharmacotherapy course. Advantages and disadvantages to each learning format should be assessed as we move into a post-COVID learning environment.

Student Perceptions of an Interprofessional Course Designed to Increase Awareness of Human Trafficking

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Objective: Describe students’ perceptions of value and usefulness towards an interprofessional course focused on human trafficking. Methods: The course included lectures, a discussion board, interactive activities, expert interviews, survivor story videos, reflection questions, and knowledge-based assessments. Upon course completion, students were asked three closed-ended questions about the value of the course using a five-point Likert scale (Strongly Disagree - Strongly Agree), and an open-ended question about how they will use the interprofessional collaboration information/skills gained in their future practice. Closed-ended questions were analyzed descriptively with frequencies presented, while the open-ended question was analyzed using a qualitative content analysis process in which authors coded using in vivo and open coding, formed major categories for the codes, and discussed the relationships between the categories to identify themes. Results: A total of 137 students representing pharmacy, physical therapy, occupational therapy, medicine, public health, dentistry, and nursing completed the course from 2017-2020. Overall, 124 students (90.5%) agreed participating in the course was a valuable learning experience, 121 (88.3%) agreed interacting with interprofessional students and/or professionals was a valuable learning experience, and 132 (96.4%) agreed they will use the information/skills gained on future rotations and in practice. Two qualitative themes revealed interprofessional teamwork is needed to address human trafficking, and courses like this supported early steps towards improving the safety of patients beyond traditional health outcomes. Conclusions: An interprofessional course focused on human trafficking provided students with the knowledge and skills to recognize signs of human trafficking, communicate in a sensitive way, and provide resources to trafficked individuals. There is a need to integrate course content into required curriculum for all health disciplines and professions in the form of didactic coursework and high-fidelity simulation.

Student Perceptions of Confidence in Performing Entrustable Professional Activities: Reflections from an Internal Medicine Elective

Melissa J. Ruble, University of South Florida Taneja College of Pharmacy, Jaclyn D. Cole, University of South Florida Taneja College of Pharmacy.

Objective: To determine the impact on student perceptions of confidence in performance of select core entrustable professional activities after the completion of a third-year Internal Medicine Pharmacy Elective. Methods: Students enrolled in a novel third-year Internal Medicine Pharmacy Elective in the Spring of 2019 and 2020 were included in the study. At the start of the semester, students were re-introduced to the entrustable professional activities (EPAs) specific to the profession of pharmacy. Students examined the levels of entrustability and the associated
definitions. Students then took a pre-course survey to assess their current level of entrustment in performing eleven select inpatient focused activities from the Patient Care Provider, Interprofessional Team Member, and Information Master domains. Students then completed the 16-week Internal Medicine Elective course and retook the survey on the last day of class to evaluate their present level of entrustment in performing those same activities. Pre- and post-course EPA levels for each activity were assessed using a two-tailed Student’s t-test with statistical significance set at \( p < .05 \). Results: A total of 40 students completed the pre- and post-course Qualtrics surveys. Of the 11 EPAs evaluated, all activities were found to have a statistically significant increase in the level of entrustment with enrollment in the Internal Medicine Elective course \( (p < .05) \). Conclusions: This study suggests that participation in a third-year Internal Medicine Pharmacy Course increases student perceptions of confidence in the level of entrustment of inpatient focused EPAs.

**Student Perceptions of Standardized Patient Encounters Using a Simulated Telehealth Platform**


**Objective:** To describe the implementation of simulated telehealth standardized patient (SP) encounters, discuss student perceptions, and offer suggestions for how these activities can be refined and employed within the curriculum. **Methods:** Students enrolled in a required three-credit Physical Assessment and Clinical Skills course participated in formative and summative SP encounters using a simulated telehealth platform. All students enrolled in the course were provided with a link to an anonymous voluntary survey to measure their perceptions relative to their participation in the simulated telehealth SP encounters. Results: All students completed the formative and summative telehealth SP encounters and forty out of 58 students (69%) completed the survey. The majority of students agreed that the encounters allowed them to meaningfully reflect on their knowledge and skills (97.5%), communication (92.5%) and the use of technology (95%) in patient care. Thirty-eight students (95%) were either fairly or completely confident in their ability to participate in telehealth encounters in the future. Thirty-eight students (95%) agreed that the technology was easy to use, while only 2 students (5%) reported significant technological issues. Conclusions: Simulated telehealth SP encounters can be successfully implemented using technology and video-conferencing platforms. Based on student perceptions, it is an acceptable method to practice and assess non-physical assessment-based skills that are traditionally evaluated in an in-person setting. Importantly, the implementation of telehealth learning activities should be a required component within Doctor of Pharmacy curricula to better prepare future pharmacists for their expanding role in delivering care through virtual formats.

**Student Pharmacist Perception of Practice Change in Doctor of Pharmacy Curriculum**

E. Michael Murphy, *The Ohio State University College of Pharmacy*, Meghan Ritchey, *The Ohio State University College of Pharmacy*, Jennifer Rodis, *The Ohio State University*.

**Objective:** The objectives of this study were to assess 1) student perceptions of learning experiences and 2) student perception of importance of learning experiences related to pharmacy practice change in the Doctor of Pharmacy (PharmD) curriculum at The Ohio State University College of Pharmacy (OSUCOP). **Methods:** OSUCOP defines practice change as: “Learning experiences that build knowledge and skills to prepare students to practice as pharmacists at the top of their licenses and to advance the role of pharmacists in patient care.” Qualitative data was gathered through one-time focus groups with PharmD Candidates at OSUCOP and converted to de-identified transcripts for thematic, qualitative analysis. Students were asked about perceptions and experiences with practice change in the didactic, experiential, and co-curriculum. Themes regarding pharmacy practice change was “rated on a scale of 1-10 (1 being not important at all and 10 being crucial) the average rating for importance of material regarding pharmacy practice change was 7.7. The three most common themes regarded too much focus on community/mainstream practice in the didactic curriculum, concern about the future of practice and practice expansion not coming to fruition, and perceived rigor of the curriculum presenting a barrier to student participation in practice change learning experiences. **Conclusions:** Students perceived practice change material in the PharmD curriculum is important, however barriers limit their participation. To increase involvement, curricula should place a greater emphasis on non-traditional career paths and forge links for student between practice change concepts and real-life practice expansion.
Student Pharmacist Perceptions When a Pharmacy Simulation Laboratory Moves to Remote Instruction During the Pandemic

Preethi S. Samuel, St. John’s University, William Maidhof, St. John’s University, Aisa Mrkulic, St. John’s University.

Objective: Assess student pharmacist perceptions and overall satisfaction towards educational methods utilized within a pharmacy simulation laboratory that moved to remote instruction during the coronavirus pandemic. Methods: The Pharmacy Simulation Laboratory component of the college’s Doctor of Pharmacy curriculum spans three semesters, beginning the P2 year of study. The laboratory moved from in-person to remote instruction in March 2020. A 33-question survey was designed, IRB-approved, and administered by the college’s Office of Assessment. Students beginning Simulation Laboratory during the in-person Fall 2019 semester were eligible to participate. Participation was voluntary, and answers remained anonymous. Survey questions assessed student perceptions of traditional in-person Simulation Laboratory learning methods, compared to impressions of pandemic-driven remote learning strategies. Responses were measured using a 5-point Likert scale and ultimately placed in one of three groups: strongly agree/agree, neutral, strongly disagree/disagree.

Results: Fifty-eight students successfully completed the survey. Overall responses did not vary significantly following the shift from in-person to remote instruction; however, some concerning trends were noted. Student pharmacists indicated the desire and need for greater faculty accessibility during the pandemic. Additionally, proper training to collect patient medical and social history, quality of faculty feedback following mock prescription activities, and observed professionalism and respect during interactions, were identified as areas to further develop during remote learning. Few to no participants expressed “disagreement” to the quality of training, no matter the mode of delivery. Conclusions: Findings revealed the need for greater faculty guidance during remote learning. Students were open to a virtual learning environment, but one that better resembles a pre-pandemic laboratory experience. Following the spring 2020 semester, changes were implemented to both the fall 2020 and spring 2021 semesters to better address student concerns.

Student Pharmacists’ Ability: Blood Pressure Assessment and Evaluation

Jason Bandy, California Northstate University, Jeffrey Nehira, California Northstate University, Veronica Bandy, University of the Pacific, Song Oh, California Northstate University, Olivia Phung, California Northstate University, Victor Phan, California Northstate University, Matthew Horton, California Northstate University, Tony Eid, California Northstate University.

Objective: Blood pressure (BP) measurement is an essential part of a patient’s physical assessment exam. Many older studies have shown that providers do not become proficient in measuring BP. Due to advances in pharmacy law and clinical skills, the researchers aim to determine if student pharmacists can accurately measure BP. The objective of the study is to determine if pharmacy students can accurately measure BP. Methods: Researchers assessed student pharmacists’ ability to measure BP, through simulated patient encounters. California Northstate College of Pharmacy students were invited to participate. Students were assessed on the following skills: back support, supported arm, bare upper arm, heart at arm level, uncrossed legs, feet flat on the floor, correct cuff size, BP cuff bladder encircled 80% of the arm, and bottom of the cuff placed above antecubital fossa. Data collected were examined using SPSS. Results: A total of 24 students were assessed. Student's planned specialty had little impact on their overall performances. Third year students were shown to have the greatest performance. No student demonstrated proficiency in all measured skills. Overall, student performed well, with at least 50% proficiency in the above skills. Conclusions: In this small cohort, students performed well, although were unable to proficiently master blood pressure measurement techniques. Study investigators recommend BP competency testing to be accessed periodically and should be continued throughout the curriculum to achieve a proficient level. Limitations of the study include small sample size (due to recent distance learning requirements), limited numbers of students from each academic year and limited number of pharmacy schools assessed. Investigators plan to repeat the study with larger cohorts and multiple schools of pharmacy in the future when distancing requirements allow.

Student Satisfaction with a Structured Post-graduation NAPLEX Preparation Program

Reza Taheri, Chapman University, Matthew R. Dintzner, Chapman University, Helen Sahli, Chapman University.

Objective: To evaluate student satisfaction with a structured NAPLEX preparation program. Methods: Students were offered a voluntary opportunity to participate in a structured and flexible NAPLEX preparation program post-graduation. Interested students were assigned to either an eight- or twelve-week program based on their academic performance in the curriculum. A weekly study plan aligned with practice exams utilizing a commercially available product formed the basis of the program. Students had the
flexibility of designing their daily study plan, adjusting, extending or even temporarily pausing their weekly assignments. At the culmination of the program, an eight-item survey assessed the students’ satisfaction with, adequacy of depth/breadth, reasons for their participation, students’ perception of the strengths of the program, and suggestions for improvement. Descriptive statistics was used to summarize the findings of the study. **Results:** 59 (72%) graduates from the class of 2020 participated in the program, 23 (39%) of which completed the survey. All respondents agreed/strongly agreed that the program was well-structured and at the appropriate depth. Additionally, 96% agreed/strongly agreed that the program covered all essential topics and felt answered promptly, while 87% agreed that the program’s duration was appropriate. “Structure” and “Anxiety about passing the NAPLEX” were the most commonly cited reasons for participating. “Structure” was the most appreciated feature of the program. **Conclusions:** Participants in this NAPLEX preparation program were satisfied with its structure and content, and perceived it as valuable. Students particularly appreciated the structure and flexibility the program offered. Further studies to assess the role of this program in improving NAPLEX performance is warranted.

**Student Support Resource Utilization and Pharmaceutical Calculations Performance**


**Objective:** Compare pharmacy students’ utilization of support resources between high and low performers in a pharmacetical calculations course. **Methods:** Pharmacy students were sent an IRB-approved survey prior to their course containing questions related to previous experience in mathematics, planned resource utilization, and perceived barriers to resource utilization. A follow-up survey was sent at the end of the semester to assess actual resource utilization. This data compared student performance on a high stakes cumulative pharmaceutical calculations examination and overall course performance. Logistic regression modeling was performed to determine the relation of exam score and overall course performance to specific resources used. Chi-square was used to compare passing versus failing outcomes with specific resource utilization. **Results:** Despite an ample mix of resource opportunities, student uptake of these were limited. Calculation performance improved with senior student assistance in sixty-one students or 63% of respondents (45 passing scores, 16 non-passing scores; \( p = .007 \)). Eighty-four (87% of respondents) reported using math review sessions (55 passing scores and 19 non-passing scores; \( p = .045 \)). Overall course passage showed significant difference with those utilizing senior student assistance (\( p = .019 \)) and other non-described resources (\( p = .013 \)). Other resources did not show significant improvement in exam or overall course performance, although self-reported utilization of those resources was limited. **Conclusions:** Resource utilization is important in calculation learning, however having multiple resources available did not by itself promote utilization. Students seem comfortable engaging senior students for assistance in pharmaceutical calculations. Faculty developed resources could be of benefit if student engagement could be encouraged and improved. The research points to retooling resources to promote student use of well-designed faculty resources rather than student self-selection.

**Successful Conversion of Simulation-Based Interprofessional Education to an Online Environment**

Zachary A. Weber, *Purdue University*.

**Objective:** Purdue College of Pharmacy has a longitudinal, required IPE curriculum in which PharmD students participate with health science learners from multiple campuses and institutions across the state. Notably, this includes Indiana University Schools of Medicine, Dentistry, Nursing, and more. The purpose of this study is to describe the process for successful conversion of an in-person, statewide, simulation-based, IPE experience to meet social distancing and online instruction requirements due to COVID-19. **Methods:** In-person event considerations were reviewed and migrated into the online format. These included student learning objectives, faculty and student rosters, online student pre-work, simulation session content, student team-standardized patient (SP) encounters, faculty-led debrief of teams after an SP encounter, assessment, and session evaluation. The focus was ensuring students achieved the same learning objectives, while keeping student/faculty time expectations, facilitator/student ratios, and logistics consistent with a live event. **Results:** In-person (Fall 2019) vs. virtual (Spring 2020) learning objectives showed comparable outcome achievement of both formats with regard to student satisfaction and skills acquisition. Overall student satisfaction was 3.79/5 for the Fall 2019 event vs. 3.83/5 for Spring 2020 virtual experience. Pre- and post-event ICCAS scores for the in-person event was 3.48/5 and 3.93/5, respectively. Pre- and post-event ICCAS scores for the virtual event was 3.73/5 and 4.36/5, respectively. **Conclusions:** Starting with the learning objectives in mind and working systematically through the process of how an in-person event can be converted online allows for
Successful Implementation of a Digital Storytelling Review in a Virtual Self-Care Pharmacy Course

Jenna Mills, University of Findlay, Jason Guy, University of Findlay, Julie H. Oestreich, University of Findlay.

Objective: Educators can simulate patient scenarios using digital storytelling, but its utility in a self-care pharmacy course has not been described. This study evaluated if implementing an innovative, virtual, digital storytelling exam review in an established self-care course enhanced students’ (1) knowledge, (2) confidence, and (3) satisfaction compared to an in-person, lecture-based exam review. Methods: Investigators created and applied an innovative digital storytelling strategy for a virtual review session in a required self-care course. In Zoom, the series of connected short videos described a progressive patient case to provide students an immersive patient care experience in a story-based interactive learning format. Students completed a knowledge assessment and received a cross-sectional survey to measure perceived confidence about their exam, as well as perspectives and satisfaction of the two different review sessions. The Mann-Whitney U and Chi-square tests were used to analyze data (alpha = 0.05). Results: Of 50 total students, 90% completed the lecture-based review survey, while 70% completed the digital storytelling review survey. Compared to the lecture-based review, students felt more confident in their ability to pass the upcoming exam (p = .009) and as satisfied after the digital storytelling review. Knowledge scores were numerically higher after the digital storytelling review, and one question reached statistical significance (p = .0004). The most common themes identified were enhanced engagement and interactivity, though time-management and breakout rooms could be further optimized. Conclusions: Exam review in a self-care course, when presented using an innovative digital storytelling format, is as effective and engaging on Zoom compared to a lecture-based format in person. This review method may increase remote students’ confidence about upcoming exams.

Summative Assessment Performance with Graded vs Ungraded Readiness Assurance Tests in Team-Based Learning Elective Course

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Objective: Is there a difference in summative assessment performance (exam grades) when individual readiness assurance tests (IRAT) are graded vs ungraded when using team-based learning (TBL)? Methods: The Ambulatory Care elective course was a 2-credit hour course with three 2-hour sessions per week offered to third professional year PharmD students in Spring 2020 (n = 47) and 2021 (n = 36) and included the same 11 topics. Course delivery occurred using TBL for both cohorts; however, class was offered using synchronous, distance learning technology across three campuses for 2020 compared to synchronous videoconferencing via Zoom in 2021. For both cohorts, IRATs consisting of 10 multiple-choice questions were administered at the beginning of each class session. There were two 25-question multiple-choice exams for each offering that covered the same topics. For 2020, IRAT grades contributed to the course grade, but not for the 2021 cohort. Exam grades, IRAT mean percentage scores, and Therapeutics GPA from the cohorts were compared using the student’s t-test. Results: There was no statistical difference in overall mean percentage IRAT (76% vs 74%, p = .3) and overall exam scores (82% vs 80%, p = .15) between the 2020 (graded) and 2021 (ungraded) cohorts. There was, however, a difference in mean percentage score of IRATs for Exam 1 material (79% vs 74%, p = .002) and Exam 1 (82% vs 75%, p = .002) for 2020 and 2021, respectively, although there was no difference in either for Exam 2. Conclusions: Changing from graded to ungraded IRATs did not affect overall summative assessment performance when delivering an elective course using synchronous TBL via Zoom. This may indicate that intrinsic motivation by students to prepare for class contributes more to class preparation than extrinsic motivation created by graded IRATs.

Survey of Pharmacogenomics Testing Among Pharmacists Licensed in North Dakota, Ohio, Oregon, and South Dakota

Marina Suzuki, Pacific University Oregon, Natasha J. Petry, North Dakota State University, Jordan Baye, South Dakota State University, Marina Galvez Peralta, West Virginia University.

Objective: Pharmacogenomics (PGx) is a developing field in pharmacy practice. As PGx testing becomes increasingly available, it is unclear whether or not pharmacists are utilizing PGx in their daily practice and how they are using PGx.
The objective of this project was to collect information surrounding the use of PGx testing from pharmacists licensed in North Dakota, Ohio, Oregon, and South Dakota. **Methods:** An online survey was developed with Qualtrics and distributed through mailing lists provided by North Dakota, Ohio, Oregon, and South Dakota Boards of Pharmacy. Survey responses were anonymous and voluntary. Responses were screened and analyzed if they met inclusion criteria: ≥90% completion rate of the questionnaire AND ≥200 seconds spent to complete the survey. Descriptive statistics were obtained with JMP Clinical 7.1. This project was granted an exempt status by Institutional Review Board. **Results:** After screening, 1126 responses were included for analysis. Respondents’ practice settings included community (40%), hospital (28%), and ambulatory care (10%). Frequency of PGx testing use was: “every day” (1%), “most days” (1%), “few times per week” (2%), “few times per month” (5%), “few times per year or fewer” (20%), and “never” (70%) with “availability/access to the testing” being the primary barrier. Commonly reported examples were related to genes encoding drug-metabolizing enzymes. Including direct-to-consumer PGx testing, 404 pharmacists (36%) have encountered patients with PGx information in their practice. **Conclusions:** While the majority of surveyed pharmacists have not used PGx testing in their daily practice, smaller percentages of pharmacists reported the use. Despite reported infrequency in use of PGx testing, the likelihood of pharmacists encountering PGx information was relatively common.

**Survey of Student Attitudes for Online Versus In-Person Recitation Period in a Pharmacotherapy Course**


**Objective:** To assess student attitudes following implementation of live, online group recitation period. **Methods:** Pharmacotherapy II, the second course of a three-course series, is offered the fall semester of the third year in a school of pharmacy with three branch campuses. The course meets for didactic instruction three days per week with a recitation period on Fridays. In spring 2020, recitation was in person and in fall 2020 an online format was adopted due to COVID-19 restrictions. In fall 2020, cases were released before class rather than during. In each recitation period, students were randomly assigned to breakout rooms of 5-6 students and had 35-45 minutes to complete 3 patient cases and 3 multiple-choice questions. Instructors moved between breakout rooms interacting with students and answering questions. Following case completion, breakout rooms ended and instructors described the clinical approach to the cases and questions. After fall 2020, students were asked to voluntarily complete a survey regarding their attitudes and learning environment preferences. Finally, cumulative exam scores were compared before (fall 2019) and after the learning format change (fall 2020). **Results:** 61/152 students responded to the survey (40.1%). Students expressed a strong preference for the online learning format during recitation (69% preferred online). 97% of students agreed or strongly agreed they met students from other sites during online recitation. 93% of students agreed or strongly agreed that cases released in advance aided in their learning. The mean cumulative exam score in 2019 was similar to 2020 (80.8% vs 81.2%, $p = .6$) **Conclusions:** Students overwhelmingly preferred the online delivery of recitation compared to in-person. While there is no observable effect on exam performance, online delivery improves the student experience.

**Teaching Conflict Management: Customizing Content to Increase Value, Confidence, and Ability During a Pandemic**


**Objective:** To determine the effect of a conflict management teaching model on how students value conflict, and their confidence and ability to engage in difficult conversations. **Methods:** Two colleges of pharmacy invited second-year students to complete a pre- and post-intervention survey assessing perceptions related to engaging in conflict-based scenarios. A mixed-method approach to assess perceived value, confidence, and ability was used, including a quantitative scale 1-6 and qualitative questions. Faculty from each program reviewed the Crucial Conversations model. Student groups of three then engaged in scenario-based conversations using the model to navigate three different cases related to COVID-19. **Results:** Seventy-six students completed the pre- and post-intervention survey (91.5% response rate). Adequacy of reliability coefficients was obtained for each measure. Cronbach’s alphas of values, confidence and ability scales were 0.82, 0.86, and 0.78, respectively and $\alpha = 0.93$, 0.86, and 0.90, respectively at posttest. Paired-samples t-test assessed differences in value, confidence, and ability concerning the management of conflict before and after exposure to the conflict management class session. The a priori alpha level 0.05 was used for all comparisons. Results indicate statistically significant improvements in value ($p < .01$), confidence ($p < .01$),
and ability ($p <= .01$) following the conflict management educational session. **Conclusions:** As detailed in ACPE Standards 2016, Key Element 11.1, targeted teaching and assessment of conflict management is critical due to the potential effect of poor conflict management or conflict avoidance on team dynamics and patient outcomes. Findings suggest use of a model equips students to confidently engage in difficult conversations.

**The Development and Implementation of an Elective Ambulatory Care Concentration**


**Objective:** The Board Certified Ambulatory Care Pharmacist (BCACP) specialty is now the second most common BPS credential held by pharmacists practicing in the U.S. The data suggest this practice area is of growing interest among pharmacy graduates; the number of Ambulatory Care PGY2 programs have more than tripled in the last 10 years (39 in 2010 to 195 in 2020) and over 190 PGY1 community-based pharmacy residency programs exist. An Ambulatory Care Concentration was developed to provide students with an opportunity to enhance skills related to practice in this area and to develop innovative and sustainable ambulatory care practice models. This project seeks to describe the development and implementation of this elective concentration. **Methods:** The concentration consists of nine credits of elective didactic coursework in the third professional year and four credits of experiential education. Didactic coursework includes required study on clinical skills with a focus in community practice, current practice guidelines, development and implementation of sustainable ambulatory care practice models and completion of an additional course in either oncology, dermatology, pediatric or geriatric pharmacotherapy. Students are required to complete a “gold standard” required ambulatory care APPE to fulfill concentration requirements. **Results:** The concentration is currently in its third offering for a total of 57 student enrollees. Student groups developed 16 practice models for real-world clinics including business and marketing plans, collaborative agreements and proformas. Elements of these projects have been implemented within several clinics profiled within the practice models course. **Conclusions:** An Ambulatory Care Concentration provides students the opportunity to enhance clinical skills and knowledge related to ambulatory care practice and develop innovative and sustainable practice models that can be implemented in real world practice.

**The Impact of an Ambulatory Care Concentration Track on Student Knowledge, Confidence and Preparedness**


**Objective:** Ambulatory care concentrations are unique in Doctor of Pharmacy curriculums. This study assesses the impact of an elective ambulatory care concentration on student perceived knowledge and confidence in related practice topics. The secondary aims are to describe the novelty, usefulness, and impact on self-reported preparedness for advanced rotational experiences, residency training, and future career opportunities. **Methods:** Beginning Fall 2018, one school of pharmacy offered a 13-credit elective Ambulatory Care concentration with didactic (PY3) and APPE components focused on outpatient clinical skills and service development. The first two enrolled student cohorts were surveyed about their didactic coursework during their final semester of the PY4 year to allow for reflection on their rotation experiences. The survey included open-ended and Likert-scale questions. **Results:** Of the 41 invited students, 20 provided usable responses for data analysis. 100% of respondents felt more confident and knowledgeable in ambulatory care disease states. For service development, 84.2% of students felt more knowledgeable and 63.1% of students felt more confident to create a clinical service as a pharmacist. Novelty was highest for the Ambulatory Care Models course where 77% of the material was considered new information. Students felt the concentration better prepared them for rotation activities, most notably clinical interventions and journal clubs (94.7%). Most students (84.2%) felt more prepared to pursue a residency due to the concentration. Open ended responses reinforced themes of improved preparation for literature review, service development, and disease state knowledge applicable to rotations, residency applications, and future practice. **Conclusions:** An elective concentration focused on ambulatory care disease states and service models improved student rated confidence, knowledge, and preparedness with reported impacts on rotation preparedness, residency applications, and future practice.

**The Stigma and Secondary Effects of the Opioid Epidemic: Implications for Pharmacy Education**


**Objective:** To explore the influence of secondary exposure to opioid use disorder (OUD) overdose (OD) deaths, OD
survival, and/or misuse/abuse of opioids, on student’s health, academic performance and perception of stigma.

Methods: A prospective, anonymous 20-question survey sent (via Qualtrics) to all students at a College for Health Professions. Evaluation items included: student demographics (8 items); experiences of loss related to opioid OD death (6 items); the influence of OUD loss on students’ mental (15 items)/physical health (6 items), academic performance (4 items); and students’ perspective on the stigma of OUD (5 items). Questions were either dichotomous yes/no or 5-point Likert scale. Analysis using descriptive statistics and the Kruskal-Wallis test for variance in distribution of student responses across professions. Results: The survey was fielded to 2028 students across the college; 358 responded for response rates of 18% (overall) and 26.3% (pharmacy students). Of those who have experienced loss related to an opioid OD-related death (n=197): 63% reported it was a close or distant friend that died, followed by 28% being a family member. Mental health (29%) was affected more than physical health (3%). The impact on ability to focus was higher for pharmacy (20%) students vs the total population (16%). Sixty-two percent indicated knowing how to discuss the impact of OUD stigma with colleagues; of the 62%, the majority were counseling (21.8%), followed by nursing (15%), and pharmacy (11%). Conclusions: Despite a small sample size, there was a large quantity of students who’ve interacted with OUD individuals. The impact on mental health could explain some of the negative impact on some student’s academic performance. There is an opportunity to educate pharmacy students on secondary exposure and OUD stigma.

Towards Fidelity in Pharmacy Education with the Patient Care Process for Delivering Comprehensive Medication Management

Catherine Cone, Roseman University of Health Sciences, Danielle Gundrum, Roseman University of Health Sciences, College of Pharmacy.

Objective: To evaluate fidelity in content and competency to the Comprehensive Medication Management (CMM) framework in a patient care skills course. Methods: The Pharmacist’s Patient Care Process II (PPCP II) skills course curriculum was compared to the nationally developed and published CMM framework. CMM curriculum content was mapped to the framework and the percentage of omissions and deficiencies in content were calculated. Qualitative information on omitted and deficient content was evaluated for further descriptive purposes. Student competency in CMM was analyzed using formative and summative assessment scores in a mastery-learning model. Results: For the content domain, CMM comprised 41.5 class hours of the total 102-hour PPCP II course. CMM curriculum omissions and deficiencies were both calculated at 14.3%, yielding an overall 71.4% alignment to the CMM framework. For the competency domain, the percentage of students initially achieving competence ranged from 76.6% and 98.7% on the three formative assessments of learning in 2018-2019 and 2019-2020. For the summative assessment, 87.5% and 69.2% respectively achieved competency on their first attempt with levels rising significantly after remediation to 98.8% and 98.7%. Overall, a significant percentage of students (98.7%) achieved competency in presented CMM materials. Conclusions: Promoting fidelity with CMM in pharmacy education is crucial to the advancement of the pharmacy profession as Dr. Sorensen and others have recently vocalized. This study found that approximately 70% of the CMM framework can be covered and mastered by students in approximately 40 hours of direct curricular time. Identified omissions and deficiencies highlight opportunities for course improvement, and remediation of skills resulted in a significant improvement in the number of students achieving competence in CMM helping to promote fidelity in the profession of pharmacy.

Training Pharmacy Students to Deliver Bad News using the SPIKES Model

Deepti Vyas, University of the Pacific, Suzanne M. Galal, University of the Pacific, John Mayberry, University of the Pacific, Claire Caringal, University of the Pacific, Vy Bui, University of the Pacific.

Objective: Determine the impact of the implementation of the SPIKES (Setting, Perception, Invitation, Knowledge, Emotions with Empathy, and Strategy/Summary) counseling model on pharmacy students’ communication skills in delivering bad news. Methods: Students attended a 1-hour learning module on the SPIKES model and completed three simulations applying the SPIKES model. Pre- and post-training surveys were administered to self-assess student confidence in using the SPIKES model. Student performance was evaluated by near-peer teaching assistants (TAs) using a grading rubric, and the student’s self-assessment was completed using the same rubric. Paired t-tests were used to test for changes in SPIKES scores measured by students’ self-assessments and TA assessments of student’s counseling simulation performance over three weeks. Results: One hundred and sixty-seven students were included in the analysis. Overall, there was a significant improvement in student self-assessment SPIKES summative scores as well as TA-assessed summative SPIKES
scores over the three weeks. There was a significant increase from the pre and post results from the student confidence survey, with the largest increase in students’ confidence in delivering bad news regarding a new diagnosis. **Conclusions:** Implementation of the SPIKES protocol in the pharmacy curriculum showed an overall improvement in students' confidence and performance in delivering bad news to patients. Additionally, student awareness increased as it relates to the impact and role pharmacists play in communicating negative health information to patients.

### Transitioning a Regional Residency Showcase from In-person to Virtual: Student and Program Perceptions

Lindsey H. Welch, The University of Georgia, Lori J. Duke, The University of Georgia, Christine M. Klein, Mercer University, Andrew Darley, The University of Georgia.

**Objective:** To assess student and residency program perception of a regional residency showcase event that was transitioned to the virtual format due to COVID-19. **Methods:** Four colleges of pharmacy have held an annual, in-person, regional residency showcase for over 10 years. Due to COVID-19, the 2020 event transitioned to virtual. Programs participated in two 30-minute slots using a self-selected platform. Eight to ten programs were scheduled per time slot during the 9-hour event. A learning management system housed program information and session links. Programs and students were invited to complete a post-event survey. Questions focused on demographics, quality of virtual interactions, comparison to prior in-person events, event logistics, and preferences for future events. **Results:** Fifty-six of 85 programs (66%) and 97 of 197 students (49%) completed at least a partial survey. The majority of students and programs rated the overall experience (80.4% students; 73.3% programs) and the quality of interactions (87.7% students; 75% programs) as good or excellent; however, among prior attendees over one-third rated the interactions as “somewhat worse” than prior years. Programs and students both appreciated the cost effectiveness, lack of travel, and access to those outside their geographic area. Programs desired more time with students and less simultaneous program competition, while students desired less simultaneous program competition and the incorporation of scheduled breaks. The majority of students preferred a future in-person event (51.2%) while programs preferred the virtual option (47.3%). **Conclusions:** Residency recruitment/interview processes nationwide transitioned to virtual in 2020-2021. While some aspects of an in-person experience are not easily replaceable, programs and students identified benefits of a virtual format. These may lead to adjustments in future offerings of these types of events.

### Using Interprofessional Teams to Identify Medical Mistakes and Room Hazards: Live versus Virtual Simulation

Mary K. Stamatakis, West Virginia University, Gina M. Baugh, West Virginia University, Lena Maynor, West Virginia University, Amy Summers, West Virginia University, Ralph Utzman, West Virginia University, Adam Hoffman, West Virginia University.

**Objective:** To compare student perceptions of ability to function as a member of a team in an in-person versus virtual interprofessional education (IPE) session focused on identifying mistakes and hazards in a simulated hospital room. **Methods:** This 2020 IPE session involved student teams identifying multiple mistakes and hazards in-person, in a simulated hospital room. In 2021, a 360-degree virtual hospital room with similar errors was created on SeekBeak, allowing students to virtually tour and enlarge specific areas of the room. Students completed pre- and post-surveys, rating their ability to perform various tasks (1 = strongly disagree to 5 = strongly agree) related to roles, communication, integration of knowledge, and performance within an interprofessional team. Student teams from 11 programs completed the 2020 in-person session (n = 641). Students from 12 programs completed the 2021 virtual session (n = 546). **Results:** In 2020, 400 and 381 students completed the pre-survey and post-survey, respectively. In 2021, responses were 554 and 455, respectively. On the pre-test, 2021 cohort students rated themselves statistically significantly lower on five of 11 measures compared to 2020. On the post-test, there were no differences in students’ perception from 2020 and 2021 across measures, except for “perform effectively on teams and in different team roles in a variety of settings” (4.49 vs 4.60, p = .04). There were no differences between pharmacy student cohorts on any post-test measure. **Conclusions:** The gain in perception of ability was larger in the 2021 cohort, with students generally rating themselves less able to perform on the pre-test, but similarly on the post-test. This session was effective in both the live and virtual environments in meeting the core competency of teams and teamwork.

### Utilization of Visual Thinking Strategies: An Interprofessional Education Module Focused on Management of Psychiatric Disorders

Raneeta A. Sharma, University of the Pacific, Marika Gonzales, University of the Pacific, Reema Chandra, University of the Pacific, Johnson Duong, University of the Pacific, Deepti Vyas, University of the Pacific, Suzanne M. Galal, University of the Pacific.

**Objective:** To assess student reactions to an interprofessional education module focused on management of psychiatric disorders. **Methods:** This 2020 IPE session involved student teams identifying multiple mistakes and hazards in-person, in a simulated hospital room. In 2021, a 360-degree virtual hospital room with similar errors was created on SeekBeak, allowing students to virtually tour and enlarge specific areas of the room. Students completed pre- and post-surveys, rating their ability to perform various tasks (1 = strongly disagree to 5 = strongly agree) related to roles, communication, integration of knowledge, and performance within an interprofessional team. Student teams from 11 programs completed the 2020 in-person session (n = 641). Students from 12 programs completed the 2021 virtual session (n = 546). **Results:** In 2020, 400 and 381 students completed the pre-survey and post-survey, respectively. In 2021, responses were 554 and 455, respectively. On the pre-test, 2021 cohort students rated themselves statistically significantly lower on five of 11 measures compared to 2020. On the post-test, there were no differences in students’ perception from 2020 and 2021 across measures, except for “perform effectively on teams and in different team roles in a variety of settings” (4.49 vs 4.60, p = .04). There were no differences between pharmacy student cohorts on any post-test measure. **Conclusions:** The gain in perception of ability was larger in the 2021 cohort, with students generally rating themselves less able to perform on the pre-test, but similarly on the post-test. This session was effective in both the live and virtual environments in meeting the core competency of teams and teamwork.
Objective: Visual thinking strategies (VTS) allow observers to look deeper and truly engage with art. The purpose of this study was to determine the impact of a VTS activity on student empathy and interprofessional attitudes. Methods: This month-long IPE module consisted of two clinical cases and two VTS discussions. Instructors created teams containing one nurse practitioner (NP) and two pharmacy students. Thirty-seven NPs and 74 pharmacy students participated in the module. Teams received two patient cases on EHRGO and were instructed to meet twice on video conference to develop a clinical plan. In Case 1, a patient suffered from schizophrenia. The patient in Case 2 was afflicted with bipolar disease and substance use disorder (SUD). In VTS discussions, students participated in a lecture on art and empathy before breaking into their interprofessional teams for small group discussions. During discussions, students each shared one art piece depicting schizophrenia (Case 1 discussion) and bipolar disease/SUD (Case 2 discussion) and used VTS prompts to discuss the art piece. Students completed the Kiersma-Chen empathy scale (KCES) and SPICE-R survey in a pre/post design. One question to measure student attitudes was added to the post-survey. Results: Eighty-six students completed both the pre/post surveys (response rate 77%). Statistically significant improvement was noted on 7/15 items on the KCES. On the SPICE-R survey, significant improvement was noted on all items. Ninety one percent of students “agreed or strongly agreed” that the IPE module was useful for learning. Conclusions: The IPE module succeeded in improving empathy and interprofessional attitudes. The VTS technique was beneficial in prompting conversation about psychiatric illness and could be a useful strategy for other educators.

Utilizing the Theory of Planned Behavior to assess intent to receive influenza vaccines during COVID-19. Angela Chu, Roseman University of Health Sciences, Vasudha Gupta, Roseman University of Health Sciences, Elizabeth Unni, Touro College of Pharmacy-New York.

Objective: The objective of this study was to assess US adults’ intentions to receive the 2020-2021 influenza vaccine during COVID-19 based on the Theory of Planned Behavior. Methods: This cross-sectional survey was administered using SurveyMonkey Audience in September 2020 to a national panel of US adults. The survey had 22 items, including demographics, past and future intentions to get the flu and COVID-19 vaccines, previous infection, preferred vaccination location, barriers, and influencing decision factors. Regarding the TPB framework, there was one statement on intention, six statements on attitudes (i.e. I believe the flu vaccine is effective), six statements on subjective norms (i.e. My family thinks I should get the flu vaccine), and four statements on perceived behavioral control (i.e. Getting the flu vaccine is completely up to me). A regression model used intention as the dependent variable and attitude, subjective norm, and perceived behavioral control as independent variables. Results: The survey was completed by 364 adults (59.1% female, 66.5% white). Twenty percent already received the flu vaccine, 44% indicated high probability of getting the flu vaccine, and 49% would get it at a doctor’s office. Concerns regarding flu vaccine adverse effects was a major barrier (41%) and family (58.1%) was the primary influencer of decisions. Participants who indicated that getting vaccinated was beneficial and doctor recommended were significantly more likely to intend to get vaccinated. Conclusions: Study results showed that the majority of participants had either received or intended to receive the flu vaccine this year. For those who indicated that they are unlikely to get vaccinated, doctors and families can play a significant role in educating patients about the benefits of vaccination and addressing concerns about adverse effects.

Utilizing Virtually Reality to Introduce Hospice and End-of-Life Care Approaches


Objective: To assess changes in students’ comfort with talking about and caring for patients at end-of-life (EOL). Methods: We created a two-part hospice and EOL care series embedded into the 3rd professional year curriculum. Part one discussed perceptions of death and deprescribing at EOL. Part two used the virtual reality experience (VRE) Embodied Labs® to follow a patient receiving a terminal diagnosis, enrolling in hospice, and coming to terms with death. Students (n=57) were administered a pre-survey prior to the series, and a post-survey following completion of the VRE. The survey included Likert-type responses, with 1 = not comfortable/negative view, and 5 = most comfortable/positive view. Due to the pandemic, the lab was modified as a pre-recorded VRE. All results were analyzed using descriptive statistics. Results: A total of 53 (93%) and 47 (82.5%) students completed the pre- and post-survey, respectively. Students were predominantly female (69.8%), and 7.5% had experience with caring for someone at EOL. Prior to the VRE, 13.2% were not comfortable with talking about EOL vs. 0% after; ratings of “very comfortable” increased from 9.4% to 14.9%. The rate of “very comfortable” responses for caring for patients at EOL increased (7.5% vs. 19.1%); “not comfortable” responses reduced from 22.6% to 4.3%. Positive views of hospice increased from 34% to 72.3%. Students indicating they would advocate for palliative care approaches versus
lifesaving measures increased from 13.2% to 36.2%. **Conclusions:** The use of a hospice-focused VRE showed an improvement in students’ comfort with talking about and caring for patients at EOL. Hospice, palliative care, and death and dying are rarely incorporated into pharmacy curriculum. This VRE, with accompanying lectures, provided an opportunity to engage pharmacy students in these topics.

**Value of Simulation Manikins in Point-of-Care Testing Training for Infectious Diseases**


**Objective:** To implement point-of-care testing (POCT) training for infectious diseases in a skills-based lab course and assess the value of manikins on student confidence.

**Methods:** Second year pharmacy students enrolled in a required skills-based lab course completed 16 hours of online modules on POCT, followed by 1 hour of lecture, and 2 hours of hands on training focused on infectious diseases. Manikins were used to train students on nasal swabs, throat swabs, and oral swabs. Students were assessed on these skills by performing them on a peer. Students completed a pre- and post-training survey regarding their comfort performing the swabs. **Results:** A total of 63 students (92%) were included in the study. All students demonstrated proficiency in performing the swabs; Proficiency was defined as a score of 90% or higher on the skills assessment. Median student confidence based on Likert style responses (i.e., ‘Strongly Disagree’, ‘Strongly Agree’) for performing nasal swabs, throat swabs, and oral swabs increased by 2.0 (95% CI: 1.5, 2.5), 2.0 (95% CI: 1.5, 2.5), and 2.0 (95% CI: 1.3, 2.7), respectively. The majority of students felt the time spent practicing was adequate for the nasal swab (n=51, 81%), throat swab (n=51, 81%), and oral swab (n=59, 94%). All students participating found the manikins to be moderately (n=17, 27%) or extremely (n=46, 73%) valuable and all students rated their overall experience with manikins as positive (n=63, 100%). Student comments revealed that manikins helped to visualize the anatomy, practice without peer discomfort, and minimize risk during COVID-19 pandemic. **Conclusions:** This study demonstrated that students found manikins valuable in POCT training for infectious diseases.

**Virtual Interprofessional Education Clinics for IPEC Core Competency Attainment**


**Objective:** In lieu of live events, the Auburn University Harrison School of Pharmacy and additional interprofessional education (IPE) partners developed virtual IPE clinics as a method for multidisciplinary student interaction and achievement of IPEC Core Competencies. We sought to determine whether virtual clinics improved student-identified interprofessional ability. **Methods:** Students from pharmacy, social work, osteopathic medicine, nursing, and nutrition complete two patient case studies in which each discipline identifies unique problems and provides solutions. Prior to and after the events, students complete an Interprofessional Collaborative Competencies Attainment Survey (ICCAS), a twenty item 7-point Likert self-reporting tool which measures self-efficacy across five domains anonymously on their smartphones. Students are divided into multidisciplinary teams and given time to assess the patient’s simulated electronic health records and develop a treatment plan. Students present their plan to faculty, receive feedback, then complete a second case. At closing, faculty facilitate a debrief discussing multidisciplinary collaboration and role identification. The change in response for each question pre- and post-event surveys were compared using an independent t-test. **Results:** From March 2020 to February 2021, 624 pre-activity surveys and 478 post-activity surveys were submitted by students that attended 15 clinics. Comparing pre- and post-event survey responses, rates of students’ self-reported ability to collaborate, communicate, identify roles and responsibilities, manage conflict, and function within an interdisciplinary team improved. Statistical significance was found in every domain assessed with the ICCAS. **Conclusions:** Virtual IPE clinics give students the ability to have meaningful interdisciplinary interaction and work towards attaining IPEC core competencies. Improved student-identified interprofessional self-efficacy through the ICCAS tool indicates students can develop interprofessional self-efficacy in a virtual medium.

**Virtual Interprofessional Opioid Education Sessions with Standardized Patients**

Connie M. Remsberg, *Washington State University, College of Pharmacy and Pharmaceutical Sciences*, Brenda Bray, *Washington State University, Elson S. Floyd College of Medicine*, Barbara Richardson, *Washington State University, Elson S. Floyd College of Medicine*, Marian Wilson,
Objective: During February 2021, over 750 health professions students from multiple institutions throughout Washington state participated in an interprofessional education (IPE) training focusing on team-based care for a standardized patient (SP) taking opioids for chronic pain. Interprofessional teams of students interacted virtually with the SP to create and discuss an integrated care plan. This study reports perspectives of pharmacy students that participated in the training. Methods: Due to the COVID-19 pandemic, the IPE session was re-designed to facilitate virtual interactions through Zoom. Using breakout rooms, interprofessional teams analyzed a patient case using the history, screening tools, and a mock prescription monitoring program (PMP) report. Teams then interviewed the SP, developed a team-based treatment plan, and discussed the plan with the SP. Voluntary pre- and post-surveys were administered through Qualtrics. Matched quantitative data were analyzed using paired t-tests. Qualitative data were evaluated for thematic findings. Results: The pre- and post-survey response rate from the 160 pharmacy student participants was 54% and 50%, respectively. Prior to the training, pharmacy students expressed the lowest self-confidence in how to make appropriate referrals for opioid use disorder and interpretation of a PMP. These two items saw the greatest improvement in confidence following participation in the training. Pharmacy students evaluated the virtual training with SPs favorably with 78% reporting that their learning during the session was “more effective” than previous in-person IPE activities. Qualitative analysis of student comments showed students valued interacting with a SP and hearing perspectives from other health professions. Conclusions: Pharmacy students’ self-confidence in key competencies was increased after the IPE session. Students reported that they valued working with interprofessional colleagues during the virtual training.

Weaving Lifelong Advocacy into the Fabric of Students: APPE Student Consortium

See-Won Seo, Albany College of Pharmacy and Health Sciences, Kelly Bach, Albany College of Pharmacy and Health Sciences, Jacqueline Cleary, Albany College of Pharmacy and Health Sciences, Katherine Cabral, Albany College of Pharmacy and Health Sciences.

Objective: Describe the process and lessons learned through the development of an APPE student consortium focusing on pharmacy advocacy, legislation, and history in New York State (NYS) to instill the value of advancing pharmacy practice. Methods: Preceptors from ACPHS created a 5-week series for APPE students focused on the advancement of pharmacy practice. The curriculum design included a review of pharmacy history in NYS, pharmacist’s portrayal in the media, review of current legislation in NYS, panel featuring leaders of pharmacy organizations, and preparation to meet with legislators. Each session was scheduled for 1.5 hours and external experts were invited to speak with the group. The last session involved the students presenting on pharmacy legislation in other states. The sessions were conducted virtually utilizing Zoom and breakout rooms. The primary outcome was assessing process measures (ie, amount of students, social media reach, provider status laws reviewed). Results: Fourteen students participated in the first offering and 19 students participated in the second offering (n = 33). Four faculty led the consortium; four external guest speakers conducted the sessions. Students created social media posts and tagged 99 users to positively influence the portrayal of pharmacists. Student groups presented on 7 states with progressive provider status laws with the culmination of “pharmacy practice wish list.” Conclusions: Legislative advocacy is not a part of the current curriculum. Through creating this innovative consortium, students learned about issues facing pharmacy practice and how to become lifelong advocates for the profession. Strengths included the small group discussion and addressing a need in the curriculum. Limitations were the small number of students, and differing student availability. There was an increased number of students with the second offering.

What Factors Impact Students’ Selection of Elective Courses?

Anna Nogid, Long Island University, Zanda Alexander, Long Island University, Mateusz Niewinski, Long Island University, Jaclyn Novatt, Long Island University.

Objective: This study aims to describe the factors which contribute to students’ elective course choices. Methods: Students at LIU Pharmacy are required to take 3 elective courses. Elective course offerings are currently determined by faculty interest, expertise, and availability. Little is known about why pharmacy students choose specific elective courses. We therefore conducted a survey to better understand student preferences and interests. Descriptive statistics were utilized to assess the data. Results: All current P1-P4 students (798) were invited to take the survey. 238 students (30%) responded and all responses were included.
in the analysis. Day/time of course offering, interest in the topic, mode of class delivery, and instructor were ranked as “very important” while factors such as perceived difficulty or recommendations from friends were not as important. 76% preferred online electives offered Monday through Thursday, during regular business hours. Many preferred to take electives online or in a hybrid fashion (44% and 25% respectively), while 13% preferred in-person instruction. Through electives, students expect to develop communication (53%), leadership (43%), research (38%), drug information (58%), and critical thinking skills (61%), increase knowledge (83%), and explore something new (63%). While we don’t currently offer this, 80% of respondents indicated interest in an elective track, with most desiring a clinical practice track. **Conclusions:** Understanding what drives students to select a particular elective course will allow colleges of pharmacy to create an elective curriculum which meets student interests, needs, and preferences while allowing students the opportunity to explore career interests, deepen knowledge, develop a focused skill set, and help them differentiate themselves from other pharmacy graduates.

**Who Killed Mr. Brown? A Hospital Murder Mystery**


**Objective:** A murder mystery activity was designed for a pharmacy practice skills lab for student pharmacists just prior to students beginning APPE rotations to incorporate quality improvement activities with clinical knowledge and teamwork. The activity was designed to assess if student pharmacists at the end of their didactic curriculum could work together to collect and analyze information to determine the correct cause of death in a situation where a hospitalized patient is lost due to medical errors. The activity then required students to complete a root cause analysis to expose them to the process of developing solutions to improve patient safety. **Methods:** In groups of five or six, student pharmacists participated in a three-scene murder mystery activity to discover a patient’s cause of death, performed a root cause analysis to identify opportunities to prevent future events from occurring, and evaluated their group’s ability to work together as a simulated interprofessional team. A thematic analysis was completed on survey responses to identify strengths and opportunities for growth among the group members. **Results:** Overall, students agreed their teams worked well together in solving this mystery and all groups were successful in identifying the correct cause of death and in completing a root cause analysis.

Group member communication was found to be both a strength and a weakness among the groups. Students were also able to self-identify conflict management strategies that they utilized during the event. **Conclusions:** Use of a murder mystery is a unique approach to foster the development of critical thinking skills in a pharmaceutical skills laboratory setting.

**Working Together: Assessing an Interprofessional Activity with Pharmacy and Veterinary Medicine Students**


**Objective:** To evaluate pharmacy and veterinary medicine students’ perceived change in interprofessional skills from an asynchronous interprofessional activity. **Methods:** In this asynchronous online interprofessional education activity, small groups of second-year pharmacy and third-year veterinary medicine students worked through four multifaceted cases. Student groups completed a case review (discipline-specific discussions), an interdisciplinary group discussion, and a group written submission. Students completed the revised Interprofessional Collaborative Competencies Attainment Survey (ICCAS) following the activity. ICCAS assesses the change in interprofessional collaboration-related competencies before and after IPE activities. A five-point Likert scale was used to measure students’ responses to prompts related to the four Interprofessional Education Collaborative (IPEC) Core Competencies and two World Health Organization (WHO) Key Messages on interprofessional collaborative practice. Short answer questions were also included to gather student feedback. **Results:** In the spring of 2021, 263 students completed the activity, and 248 completed the survey (n= 158 pharmacy students, n=90 veterinary medicine students). For each discipline, each item on the ICCAS was significant (p<.001). Nearly 80% of students reported that their ability to collaborate interprofessionally improved compared to before the activity. Nearly all students (79% or more) agreed or strongly agreed increased their abilities in the four IPEC Core Competencies. More than 93% of students agreed or strongly agreed with the WHO Key Messages statements. **Conclusions:** The activity increased students’ perceived interprofessional skills, and the majority of students reported that it increased their abilities in the four IPEC Core Competencies. The asynchronous and online format connected two disciplines across two campuses while allowing for flexible completion of the activity during a time of distance learning.
SOCIAL AND ADMINISTRATIVE SCIENCES
A Comparative Evaluation of Three Different Escape Room Modalities for Doctor of Pharmacy Students

Estela Lajthia, Howard University, Miranda Law, Howard University, Malaika Turner, Howard University.

Objective: Describe the unique development of escape room learning activities for Doctor of Pharmacy students in different environments: virtual, simulation center, and small group room setting. Methods: Using principles of gamification, escape room learning activities were developed in Spring 2018 (clinical laboratory), Spring 2020 (Simulation Center) and Fall 2020 (virtual). All escape room activities were integrated into laboratory courses encompassing a variety of clinical topics including diabetes, anxiety, asthma, endocrine disorders, and GI diseases. In the small group setting, students worked on paper-based and injection technique activities, requiring an in-room observer due to limitations with available technology. Development of an escape room in the Simulation Center was a collaboration between the College of Pharmacy and the Simulation Center staff that allowed the use of interactive healthcare mannequins and other equipment to simulate a standard healthcare environment. The virtual escape room was created utilizing Google Forms and conducted into the laboratory course via Zoom during the pandemic to adapt to the virtual learning environment.

Results: Each escape room environment runs differently and affords different benefits and barriers to implementation. The small group room setting allows for implementation of activities with minimal need for technology and financial resources but higher level of human resources. The Simulation Center setting offers real world simulation scenarios but requires a high level of financial resources and coordination with multiple parties. The virtual setting helps students critically think while staying engaged in a virtual environment and requires minimal human or financial resources. Conclusions: The use of gamification through escape rooms can be implemented through multiple modalities and can be adapted to fit the available resources and learning setting.

A Retrospective Analysis of Underrepresented Minority and International Graduate Students Schools/Colleges of Pharmacy

Omolola A. Adeoye-Olatunde, Purdue University, Tessa J. Hastings, University of South Carolina, Kristine Willett, The University of Mississippi, Jingjing Qian, Auburn University, Terry-Elinor Reid, Concordia University Wisconsin, Alok Bhushan, Jefferson College of Pharmacy, Thomas Jefferson University, Surajit Dey, Roseman University of Health Sciences.

Objective: Recruitment, retention, and support of a diverse graduate student population in Schools/Colleges of Pharmacy (SoP/CoP) is critical to producing innovative and
The objective of this study was to characterize demographics of US SoP/CoP graduate students. **Methods:** This is a retrospective, descriptive cross-sectional analysis using the AACP Institutional Research data from 2015-2019. Domestic students are categorized as 1) Underrepresented minority (URM); 2) White; 3) Asian; and 4) other. URM was defined as Black or African American, Hispanic/Latino, American Indian, Alaska Native, Native Hawaiian, or other Pacific Islander students. Race/ethnicity are not reported for international/foreign students. Descriptive statistics were used to characterize the distribution of different racial/ethnic and international/foreign groups. **Results:** During the study period (2015-2019), URM PhD and MS students increased from 216 (6.6%) to 284 (8.8%) and from 92 (8.2%) to 131 (11.0%), respectively. However, the number of international/foreign PhD and MS students decreased from 1679 (51.0%) to 1565 (48.6%) and from 660 (58.6%) to 572 (47.9%), respectively. The numbers of White and Asian students enrolled in PhD programs remained similar from 2015-2019, however the numbers of White and Asian MS students increased from 239 (21.2%) to 305 (25.6%) and 101 (9.0%) to 131 (11.0%), respectively. **Conclusions:** The proportion of URM graduate students enrolled in SoP/CoP increased between FY2015-FY2019; however, the proportion of international/foreign graduate students decreased. Future studies should explore the potential impact of the COVID-19 pandemic on graduate student diversity in SoP/CoP and identify additional factors contributing to and recommendations to support URM graduate student recruitment.

**A Systematic Review of Diabetes Education Impact on Quality of Life: US versus International Settings**


**Objective:** The American Diabetes Association’s Standards of Medical Care in Diabetes 2019 endorse pharmacists as integral providers of diabetes self-management education (DSME). Diabetes is a frequent focus in pharmacist-led disease management programs; knowing how DSME impacts Quality of Life (QoL) in type 1 diabetes (T1D) is useful for current and future pharmacists. The purpose of this report was to describe DSME interventions and impact on QoL with a focus on systematic review results comparing studies conducted in the United States (US) and internationally. **Methods:** Modified Cochrane method search and review tiers were conducted utilizing PubMed, PsychInfo, CINAHL, Embase, Web of Science, and Cochrane, with terms ‘diabetes education‘, ‘quality of life’ and ‘outcomes’; RCT articles published between January 2007 and April 2020 were retained. Two researchers independently reviewed and applied inclusion criteria at each review tier and discussed to consensus retain/reject decisions. Methodological quality was assessed independently by 2 researchers using the Cochrane Risk of Bias tool. **Results:** A total of 17 studies (19 reports) were retained (11 international; 6 US). Comparisons between US and international studies demonstrated differences mostly in patient characteristics: age, race/ethnicity, duration of diabetes, and insulin delivery modality. Significant heterogeneity was found in: DSME content, interventionist type, and methods/measures. Only four international studies reported significant differences between intervention and usual care groups for QoL outcomes. Three reported improved diabetes-specific QoL. Mixed results were reported for DSME impact on patient-reported QoL in retained US studies. **Conclusions:** Heterogeneity in methods and measures challenged outcomes and comparisons, making it difficult to draw comprehensive conclusions. Future research outlining specific roles for pharmacists in DSME and impact on QoL of persons with T1D is warranted.

**An Updated Review of Suicide Prevention Programs for Pharmacists and Training Opportunities for Pharmacy Students**


**Objective:** The objective of this scoping review is two-fold: 1) to report an updated review of the published literature addressing gatekeeper suicide prevention training programs for community pharmacists and 2) to describe to what extent mental health first aid and suicide prevention training has been incorporated into pharmacy school curricula. **Methods:** PubMed, International Pharmaceutical Abstracts (IPA), PsycINFO, Scopus, and Google Scholar were searched for articles published in English between January 2018 and December 2020. Articles were excluded if they: 1) did not describe an educational or training program for pharmacists, student pharmacists, or pharmacy staff; 2) focused solely on a mental health education program that did not include suicide; 3) focused solely on attitudes towards suicide; or 4) did not provide sufficient detail about the training program. **Results:** Seven publications met inclusion criteria and were reviewed in detail. Five targeted student pharmacists and two were larger gatekeeper trainings that included pharmacists and other community leaders in pharmaceutical sciences.
personnel, such as priests and policeman. Most trainings were conducted in-person and included an interactive or role play scenarios to allow learners to practice verbal and behavioral skills. Most trainings assessed changes in knowledge (86%), identifying signs of suicide (71%), and provision of referral resources (71%). **Conclusions:** Since a 2018 review, several new suicide prevention training programs were reported for community and student pharmacists. The growing number of programs for student pharmacists shows increasing interest by pharmacy schools in addressing suicide prevention as part of their curricula. However, variation between programs including the frequency and type of content delivered should be evaluated to better understand what learning methods best prepare pharmacy professionals to engage in suicide prevention gatekeeping behaviors.

**Assessing Confidence and Knowledge of Student Pharmacists’ Basic Diabetes Self-Management Skills**


**Objective:** The significance of diabetes self-management and recent advances in diabetes medications call for healthcare professionals’ preparedness in educating patients. This study aimed to assess the confidence and knowledge of student pharmacists in specific aspects of basic diabetes self-management skills. **Methods:** An online questionnaire was administered over a four-week period in February 2021 to third-year student pharmacists who had completed their didactic work at one United States college of pharmacy. Students indicated their level of agreement (strongly disagree, disagree, agree, strongly agree) with nine confidence items, identified the correct response (from multi-choice lists) for nine knowledge items, and responded to five demographic/descriptive questions. Data were summarized using descriptive statistics. **Results:** Forty-five third-year student pharmacists completed the questionnaire. Majority had experience working with diabetes patients (77.8%), worked with diabetes patients in community pharmacy settings (64.4%), had ≤5 years work experience with diabetes patients (84.4%), and saw ≤10 diabetes patients weekly (66.6%). Most commonly students saw diabetes patients for self-management/problem (low/high blood sugar) solving education (37.8%). Majority of students agreed/strongly agreed that they were confident in their knowledge for eight of the nine confidence items, and disagreed/strongly disagreed that they were confident in their knowledge of how to administer GLP-1 receptor agonists. Majority of students correctly answered six of the nine knowledge items correctly. The mean number of correct answers was 5.2 ± 1.6. **Conclusions:** Among this sample, student confidence of their knowledge about evaluated aspects of diabetes self-management was generally high, yet the average student only correctly answered five out of nine knowledge questions, suggesting third-year student pharmacists’ perceptions of their knowledge was greater than their actual knowledge. Student pharmacists may therefore require additional training on this topic.

**Assessment of Pharmacy Student Knowledge, Attitudes, and Behaviors Related to Climate Change and Human Health**

Hayley Blackburn, *University of Montana*.

**Objective:** To measure P3 pharmacy students’ baseline knowledge, attitudes, and behaviors related to climate change and its relationship to health to inform future curriculum development. **Methods:** In 2021, third-year pharmacy students (N = 55) were asked to complete a questionnaire based on the Climate, Health, and Nursing Tool (CHANT) to measure their understanding of and engagement with climate change. **Results:** Survey completion rate was 84% with a majority of those who responded being at least “somewhat concerned” about health impacts of climate change (85%), including the one-third who were “extremely concerned” (35%). Students anticipated climate change will have at least a moderate impact on their careers (75%), impact their personal health (78%) and the health of their patients (85%). Many pharmacy students wanted to take action in their professional roles, including changing practice to reduce greenhouse gas contributions (60%), teaching patients about climate impacts on health (59%), and preparing for health impacts due to climate change at their workplace (66%). Despite their level of concern and desire to act, two-thirds (66%) indicated having little to no prior education on these topics. Students most frequently cited a lack of knowledge (34%) and uncertainty about what to do (43%) as reasons for not taking action. **Conclusions:** While pharmacy students express concern about climate change and its impact on health and their future careers, their lack of knowledge appears to be a primary barrier to taking action. These results demonstrate the need to increase educational opportunities for pharmacy students to better understand climate change and how they can reduce its impact on health.

**Association between Message Frames, Beliefs, Intentions, Medication Adherence, and Asthma Control among College Students**

Objective: Framed messages that emphasize losses or gains in message presentation may improve medication adherence and asthma outcomes. Using the Theory of Planned Behavior (TPB) as the conceptual framework, this study examined the relationship between message framing and college students’ Beliefs about Inhaled Corticosteroids (ICS), Intentions to take ICS, Medication Adherence, and Asthma Control. Methods: College students who were >18, self-reported being diagnosed with asthma, and were prescribed an ICS were recruited and randomized to receive either gain- or loss-framed messages three times per week for eight weeks. Data collection occurred at baseline and week 8. Measures included Beliefs (the difference between perceived necessity and the perceived concerns of ICS), Intentions, Adherence, and Asthma Control. Path analysis assessed the relationship between the message frame, Beliefs, Intentions, Adherence, and Asthma Control at week 8. Identical path analysis with baseline data was also performed to compare the models obtained at baseline versus the end of the study. Results: Forty-three students took part in the study. In support of the TPB, the effects of Beliefs on Adherence were mediated by Intentions. However, the mediation was partial because Beliefs had a direct effect on Adherence. There were stronger associations between 1) Beliefs and Adherence, and 2) between Beliefs and Intentions at the end of the study compared to baseline suggesting the effect of the intervention. However, the association between Intentions and Adherence decreased at the end of the study compared to baseline. Conclusions: Improving patients’ Beliefs about the necessity of ICS may lead to greater Intentions to take their medications and Medication Adherence. Over time, individuals’ Beliefs may be more influential in informing their medication-taking behavior compared to Intentions.

Attitudes of Pharmacy Personnel in Expanding Technician Roles in Arizona

Bernadette R. Cornelison, The University of Arizona, Mally Gage, University of Arizona, Paige Pasceri, The University of Arizona, Jamie Swenson, The University of Arizona.

Objective: To identify attitudes of pharmacy personnel regarding expanding pharmacy technician roles in Arizona. Methods: A seven question Qualtrics survey was emailed to 11,869 pharmacists and 19,561 technicians in the state of Arizona. The questions focused on the attitudes of pharmacy personnel towards the expansion of pharmacy technician roles in Arizona as well as the level of training/education and Continuing Education (CEs) that should be required if technician roles were expanded. Results: Questionnaires were completed by 708 pharmacists and 672 certified pharmacy technicians in Arizona. Overall, pharmacists and technicians agreed that technicians should not have their roles expanded at this time with the exception of technicians providing immunizations (p<.0001). Differences between the two groups occurred regarding technicians taking verbal transfers (p<.0001) and new prescriptions over the phone (p < .0001) where technicians agreed they should perform these tasks while pharmacists disagreed. Conclusions: Pharmacists and pharmacy technicians have similar views regarding technician role expansion in Arizona. At this time, technicians’ roles should not be expanded and if role expansion were to occur, additional training and education should be required.

Attitudes towards the New Pregnancy and Lactation Labeling Rule and the Lettered Risk Category System

Jessica Lyons, Howard University College of Pharmacy, Ghada Alem, Ministry of Health Saudi Arabia, Mary K. Awuonda, Howard University, Monika Daftary, Howard University, La'Marcus Wingate, Howard University, Earl Ettienne, Howard University.

Objective: To assess attitudes of the new FDA pregnancy and lactation labeling Rule (PLLR) and the lettered risk category system (LRCS) among pharmacists Methods: A cross-sectional study to evaluate attitudes of the new FDA PLLR and the LRCS was conducted among pharmacists. The primary outcomes evaluated were attitudes towards the FDA PLLR and the LRCS. Descriptive statistics were conducted. Factors associated with attitudes towards the FDA PLLR and LRCS were analyzed using chi square and fishers exact test. All analysis was conducted using SPSS version 27 and alpha value of 0.05. Results: A total of 131 pharmacists were included. Of them majority were female (61.8%), did not complete a residency (80.9%), worked in the community pharmacy setting (39.7%), and provided direct patient care to women who are pregnant or of reproductive age (58.9%). The mean number of years in practice was 7.5 years (SD ± 10.1 years). Overall, 54.1% of the pharmacists agreed that the PLLR was a useful source to use; however, 1 out of every 5 pharmacists reported unfamiliarity with the PLLR. Findings from the bivariable analysis found a significant association between the practice setting and attitudes towards the LRCS. Specifically, there was a difference in the proportion of pharmacists who agreed that the LRCS was a useful source (Community Pharmacists =85.7%; Hospital= 76.2%; Other= 52.0%; p=.009). There were no differences in PLLR attitudes by practice setting (p=.661). Conclusions: Overall,
suboptimal exposure to the PLLR was found among participating pharmacists. Additionally, differential attitudes on the resourcefulness of the LRCS were found by practice setting.

**CALM (Centering and Living Mindfully): Evaluating a Mindfulness Practice Intervention on Healthcare Student Well-Being**

Rachele Arnoldussen, *Concordia University Wisconsin*, Elizabeth Buckley, *Concordia University Wisconsin*.

**Objective:** The present study aimed to evaluate the effects of a faculty-developed Centering and Living Mindfully (CALM) program on student perceived stress/distress, anxiety, depression, resiliency, well-being, and overall understanding of mindfulness. As stress, burnout, and mental health issues appear to be on the rise in the United States, recent mindfulness interventions have shown positive outcomes in healthcare professionals and trainees. **Methods:** The CALM program encompassed an 8-week mindfulness training program, including a 90-minute once-weekly virtual session (30 minutes of reflection/discussion followed by a 60-minute session of mindful movement with a certified instructor), daily self-practice via the UW Healthy Minds APP, and weekly reflective journal prompts. The study population was comprised of pharmacy residents, healthcare professional students, and student-athletes. Students were recruited to this program through email and class announcements with IRB approval. Data collection was informed by the phase I primary pilot and included a pre and post survey utilizing four validated scales to measure program outcomes; The Brief Resilient Coping (BRC) scale, The Warwick-Edinburgh Mental Well-being (WEMWBS) scale, The Five Facet Mindfulness Questionnaire (FFMQ) and The Depression Anxiety Stress Scales (DASS). **Results:** Out of 100 participants, 30 completed both the pre and post surveys (n = 30). A matched-pairs t-test was used to compare the scores of each survey. Results showed significant increases in scores for all for wellness metrics; BRC (2.096, p < .05), FFMQ (4.387, p < .05), WEMWBS (3.337, p < .05), and DASS (2.444, p < .05). **Conclusions:** Study results illustrate the benefits of a mindfulness intervention on student well-being. The authors now aim to evaluate the effects of the CALM program on faculty and staff at Concordia University Wisconsin.

**Communication in Pharmacy Higher Education to Improve Work Life and Mitigate Burnout**


**Objective:** Research question: What content, style, timing, tone, and initiation of communication from pharmacy peers and supervisors best connotes “reassurance of worth” and mitigates burnout? **Methods:** This study employed semi-structured interviews to acquire rich information from pharmacy academicians acquired from a purposive sampling process. Participants: 1) were known by or recommended to the study investigators as being actively involved with the American Association of Colleges of Pharmacy (AACP), 2) deemed to likely make substantial contributions to the interview, and 3) represented a cross-section of faculty by discipline, institution, and demographic characteristics.

**Characteristics of Students in the Nation's First Medical Cannabis Master of Science Program**


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**Characteristics of Students in the Nation's First Medical Cannabis Master of Science Program**

The interview guide was constructed on the basis of motivation language theory (MLT) and provisions of social relationships theory. Interviews were conducted via zoom and transcribed verbatim. Themes were gleaned using open coding, and then audited and member-checked. Results: Data saturation occurred after eight interviews. Two primary themes emerged, including direction-giving guidance - particularly pertaining to professional development and tenure, and reassurance of worth in the form of reinforcing roles by inviting participation, praise, and/or rewards. Interviewees highlighted the importance of empathetic, yet practical language among peers, and supervisor-initiated, meaning-making language rather than generic platitudes. Conclusions: Mitigation of burnout and faculty contributions are improved through empathetic, personal language that provides reassurance of worth. Invitations to collaborate are seen as collegial and engaging. This study demonstrated the usefulness of motivating language theory and social provisions in guiding those communications among pharmacy academicians.

Community Members’ Perceptions of COVID-19 and COVID-19 Vaccine

Jody Gonzalez, Loma Linda University, Lisa T. Hong, Loma Linda University, Paul Gavaza, Loma Linda University School of Pharmacy.

Objective: The purpose of the study is to investigate community members’ perceptions about COVID-19 and COVID-19 vaccines. Methods: This study was a cross-sectional cohort survey of community members receiving the COVID-19 vaccine. Participants completed a 45-item Qualtrics survey aimed to evaluate individuals’ knowledge and beliefs about COVID-19 (eg, perceived risk, severity) and COVID-19 vaccines (eg, perceived benefits and barriers), as well as their intent to receive a second dose. Results: A total of 1295 complete responses were analyzed. The average age of respondents was 46 ± 14.7 years with 48.7% Caucasian and 30.1% Hispanic. Most respondents were female (64.1%), live with others (89.9%), have health insurance (97.8%), have at least a 4-year degree (79.2%), and identify as spiritual (85.0%). Many received the Pfizer vaccine (79.7%) and 97.7% intended to receive their second dose. Respondent’s concerns regarding COVID-19 were mostly surrounding disruption to their daily activities (86.3%), serious health problems (92.1%), and exposing other members in their home (86.3%). Most respondents believed that COVID-19 vaccines are safe (91%), effective (95.9%), and would recommend the vaccine to family/friends (97.2%). Some respondents believed they did not have enough information about COVID-19 vaccines (16.0%), that one dose alone was sufficient to protect from COVID-19 (8.4%) and that the vaccine offered total protection against the virus (9.2%). Interestingly, COVID-19 vaccination advice came mostly from family/friends (84.1%) or social media (77.9%) rather than healthcare professionals (42.1% providers, 36.4% nurses, and 18% pharmacists). Conclusions: Although most individuals held favorable views and beliefs, our results indicate room for improvement in knowledge of COVID-19 among community members. The limited role of healthcare professionals in influencing patient vaccination highlights an opportunity to enhance community education.

Comparison of a Self-Care Therapeutics Course Taught in the P1 versus the P2 Year

Elizabeth Bald, The University of Utah, Demetrius Kortides, The University of Utah, Nicholas Cox, The University of Utah, Hanna Raber, The University of Utah, James Ruble, The University of Utah College of Pharmacy, Kara Nazmilia, University of Utah Health, Boyd Richards, The University of Utah.

Objective: This study compares student learning outcomes, behaviors, and attitudes in a non-prescription drug and self-care therapeutics course taught in the second professional (P2) year versus the first professional (P1) year of a pharmacy school curriculum. This course utilizes a flipped classroom model that comprises in-class simulated case consultations (formative assessment) and midterm and final multiple choice exams (summative assessment). Methods: P2 and P1 classes participated in the non-prescription drug and self-care therapeutics course separately, but simultaneously. Student volunteers and course teaching assistants were interviewed in focus groups to collect perceptions of student learning behaviors and attitudes. One-on-one interviews were also conducted with a subset of instructors by an outside educational evaluation specialist. P2 and P1 mean class performance on case consultations and exams were compared. Results: No difference in P2 versus P1 mean scores were found on consultations or exams. P1 students reported more consistent completion of pre-class reading and less distraction from other courses compared to P2 students. Students, teaching assistants, and instructors reported that advantages of teaching the course in the P1 year included less stress on students, greater eagerness to learn and subsequently apply newfound skills in practice. Reported disadvantages of teaching the course in the P2 year included distraction from the concurrent P2 integrated pharmacotherapeutics course, and tension between real-world experience and the constraints of the grading rubric. Conclusions: P1 students performed as well as P2 students...
Comparison of Early COVID-19 Immunization Practices at Community Pharmacies During a Public Health APPE Elective

Mary F. McManus, Wilkes University, Samantha Bartholomew, Wilkes University, Teagan Bigelow, Wilkes University, Marie Roke Thomas, Wilkes University, Harrison Ferro, Wilkes University.

Objective: Determination of best practices (clinical and procedural) as applied to early COVID-19 immunization initiatives delivered by a cohort of independent community pharmacies. Public Health Elective APPE students were deployed to multiple sites to support and analyze immunization clinics initiated by community pharmacies. The APPE students have the skill set necessary to plan, administer and reflect on delivery of patient centered community immunization clinics. This student driven comparative observational study identified considerable variability in both clinical and logistical parameters. Strengths and challenges were interpreted through a lens in accordance with evidence-based guidelines for the current COVID-19 pandemic.

Methods: During a five-week period, 3 APPE students were rotated through a cohort of 6 community pharmacies. Immunization clinics were classified according to on-site, off-site and curbside clinics. For each type of clinic, primary observational data collected included scheduling, registration, patient screening, vaccine preparation, immunizers, patient counseling, and post immunization documentation.

Results: There were significant variations across clinics in both logistical and clinical outcomes. The most common challenges were associated with scheduling and documentation due to insufficient resources. Sites that utilized an online format improved efficiency however this may decrease access to less computer literate populations. Volunteer health professionals significantly improved the vaccination efforts with APPE students expanding the range of the public health initiatives. The 15-minute post-vaccination observation time was generally underutilized for patient monitoring and counseling.

Conclusions: Public Health APPE students expanded vaccination initiatives by increasing access to community-based clinics. Online registration and documentation improved efficiency that needs to be streamlined to accommodate mass vaccination efforts. Insufficient post-vaccination monitoring poses a risk to patient safety and should be restructured to provide patient education.

COVID-19 Vaccine Hesitancy or Acceptance in High School Students

Manas Mandal, Roseman University of Health Sciences, Sohini Mandal, Green Valley High School, Julian Vale, Green Valley High School, Anna Vinciguerra, Green Valley High School.

Objective: The objective of our research is to understand the overall, and coronavirus infectious disease 2019 (COVID-19) vaccine-specific awareness, information/ misinformation, hesitancy/acceptance in high school students of the Las Vegas valley. Methods: A 12-question survey was developed using Google Forms and administered to the high school students to gain a deeper understanding regarding their vaccine awareness, hesitancy or acceptance. Participants were invited via social media as well as through Clark County School District (CCSD) teachers and the survey was administered online. The survey participation was voluntary, confidential with informed consent and the response was collected anonymous without personally identifiable information. The research was conducted with IRB approval from the University of Nevada Las Vegas.

Results: Survey responders (125) were 49.6% white, 29.6% Asian origin, and 7.2% multiracial background. 54% were Nevada residents, rest from eight other states. 55.2% of the responders belonged to the age group 16-17 year, while 24% were 18 or older. A vast majority (92.8%) agreed on the concept of ‘vaccine protection to individual and to the community.’ 91.2% reported that they understand the ‘science behind vaccine’ and 87.2% agreed on ‘vaccine safety.’ 73.6% indicated that they would receive both doses of the COVID-19 vaccine when available. 60% of the responders agreed on ‘adoption of legislation to mandate COVID-19 vaccination.

Conclusions: A significantly high COVID-19 vaccine acceptance was observed in the surveyed student population which is higher than the national average. A significant majority of the students also indicated that they understand the scientific basis and safety aspects of vaccine. A nation-wide survey in high school students would help with policy formulation to achieve the desired vaccination and immune protection to facilitate school opening safely.

Description of Pharmacist Activities Reported in eCare Plans

William R. Doucette, The University of Iowa, Arwa Al-Khatib, University of Iowa, Lindsey Ludwig, CPESN Iowa, Scott Egerton, University of Iowa.

Objective: To support its members’ practice transformation and develop capacity to routinely submit eCare plans, the Community Pharmacy Enhanced Services Network

(CPESN) USA implemented a 5-year project called Flip the Pharmacy (FiP). The objective of this study was to describe the care activities reported in eCare plans submitted by CPESN Iowa member pharmacies during the first 15 months of Flip the Pharmacy. **Methods:** Data were obtained from CPESN USA for the eCare plans submitted by 83 CPESN Iowa pharmacies from October 1, 2019 to December 31, 2020. SNOMED codes reported for Encounter reason and Procedures were analyzed by calculating frequencies. Next, we created aggregate groupings of SNOMED codes to develop categories of pharmacist actions reflected in the eCare plans. **Results:** Overall, the eCare plans involved 18,891 patients, with 54.1% female and a mean age of 62.3 (SD = 18.2). A total of 39,751 eCare plans were submitted, containing 106,873 reported procedures. Eight categories of pharmacist activities were created. The category with the most reasons for encounter (46.9%) and procedures (41.9%) was medication synchronization. Immunizations were relatively common for encounter reasons (18.1%) and procedures (17.3%). Medication review also occurred frequently (27.1% of procedures) and targeted almost 40 different types of medication. Though reported less often, patient education involved 65 different topics. Other categories included monitoring, hypertension-related actions, adherence and pain & opioid actions. **Conclusions:** Medication synchronization is a foundational domain for community pharmacy practice transformation. Immunizations and medication reviews also were important activities. CPESN Iowa pharmacies are performing a broad array of services, reflecting the range of their patients’ needs. Flip the Pharmacy appears to be supporting expanded roles for community pharmacists.

**Developing a Framework for Assessing Affective Domain Outcomes Within Professional Development Courses: A Pilot Study**

Rosalyn P. Vellurattil, University of Illinois at Chicago College of Pharmacy, Benjamin J. Shultz, University of Illinois at Chicago College of Pharmacy.

**Objective:** The UIC College of Pharmacy (UIC COP) implemented a 2 credit, core course (P2 year, Phar 463) and PhLAMES advising program (non-credit, P1-P4year, Phar465-472) to assess the affective domain outcomes identified in ACPE Standards 3 and 4. The objective of this study was to create a framework for assessing professionalism outcomes within a professional development course sequence. **Methods:** Phar 463 students completed a team service learning project in the community that is evaluated via survey by a community partner. Within the PhLAMES courses, students completed two co-curricular activities per semester and submitted an end of year reflection on their experiences. Reflections were assessed with an internally developed rubric created by the Office of Assessment and compared for internal consistency. Survey item scores measuring professionalism were compared to reflection scores to examine congruence between community partners’ perceptions of professionalism and those of the students. **Results:** Ten students from the Class of 2023 completing both the Phar 463 project and a reflection in PhLAMES (P1 year) were randomly selected for pilot inclusion. All students received maximum points (5/5) on the community partner survey for items 12 and 13. Evaluators (n=2) agreed on six of ten scores (Cohen’s kappa = 0.4), suggesting the rubric is moderately reliable. While the group average of the rubric scores on the self-reflections were below expectations in the professionalism domain, six students met expectations. **Conclusions:** Most students met performance expectations on the self-reflections; however, the assessment framework identified a disconnect between students displaying professionalism to others and how they self-understood the concept. Some students did not directly address professionalism in their reflections, indicating a need to revise the reflection prompt to provide specific guidance.

**Evaluation of the Student Educational Assistance Program Before and During the COVID-19 Pandemic**


**Objective:** The main objective is to analyze the effect of the pandemic on our SEA (Student Educational Assistance) Program services in two areas: if using SEA materials helped boost their confidence (yes/no), and if using SEA materials helped decrease their stress (yes/no). **Methods:** Surveys conducted by SEA members in Fall 2019, Spring 2020, and Fall 2020 on SEA material feedback were emailed to the University of Connecticut Doctor of Pharmacy Class of 2023 students. No email or demographic information were collected. The Fall 2019 survey only asked if SEA services improved their performance on their exams; considered a surrogate measure for increased confidence and lowered stress. Descriptive and bivariate statistics were conducted. **Results:** Statistical analysis was done via SPSS 27. There were 111 responses collected from the survey in Fall 2019, 45 responses from the post-lockdown survey conducted in Spring 2020, and 42 responses in Fall 2020.
(n=198). Across all surveys, most students reported increased confidence and lowered stress due to SEA services. Compared with the Fall 2019 data, there was significantly fewer individuals in Spring 2020 that responded “yes” to increased confidence and lowered stress from SEA services ($p<.05$). **Conclusions:** Our survey responses show that SEA Program resources has maintained the confidence boosting and stress lowering effect during the pandemic. Based on the consistency of responses in Fall 2020 compared to Fall 2019, it is thought that the fewer positive responses in Spring 2020 were likely due to the change in curriculum from in-person to virtual and subsequent accommodation in Fall 2020. Future research is needed to explore how to sustain student confidence and reduced stress given changes in learning experiences (virtual).

**Examining Social Determinants of Pharmacy Students: The Case for Structural Experiential Education in Pharmacy Education**

Olihe Okoro, *University of Minnesota.*

**Objective:** Research demonstrate that social inequalities are key drivers of poor health outcomes among marginalized populations. Therefore, healthcare providers must have the capacity to “recognize and respond to health and illness as the downstream effects of broad social, political, and economic structures.” The objective of this survey was to compare the social determinants of students currently enrolled in the first year of the PharmD program to those of the general patient population they are likely to serve. **Methods:** A web-based questionnaire developed from the Protocol for Responding to and Assessing Patient Assets, Risks, and Experiences (PRAPARE), was administered to first year pharmacy students as pre-work for a class on social determinants of health. Frequencies and proportions used to characterize the data were compared with similar demographic indices of the MN state population. **Results:** Response rate was 90.3% (112/124). Eighty-one percent of respondents had employment-based or privately purchased insurance compared to 63% of MN population (2019). One in four MN households are cost-burdened by housing compared to 5.4% of respondents (n = 6) reporting unstable housing. In 2020, 8.6% of households experienced food insecurity, while 7.1% of respondents (n = 8) reported ever lacking food due to cost, access and/or availability; and 63.4% never had any basic need unmet. While transportation needs in MN vary disproportionately by race/ethnicity, region and socioeconomic status, 83.9% of respondents had never had unmet transportation needs. **Conclusions:** The social determinants of pharmacy students look very different from those of the general patient populations they will serve. Experiential education focusing on building structural competency is critical to enable students make the connections between structural inequities and health, and consequently provide more effective patient care as pharmacists.

**Experiences and Perspectives of Pharmacists Regarding Spiritual Care in Pharmacy Practice**

Paul Gavaza, *Loma Linda University School of Pharmacy,* Bhaktidevi Rawal, *Loma Linda University School of Pharmacy,* Elizabeth J. Taylor, *Loma Linda University School of Nursing.*

**Objective:** Pharmacists are encouraged to provide whole person care. Because holistic care is conceptualized as including spiritual care, this study investigated the experiences and perspectives of pharmacists regarding spiritual care in pharmacy practice. **Methods:** Data for this cross-sectional, qualitative study were collected from a survey mailed to 1,000 randomly selected registered pharmacists in California in 2019. Data reported here are the responses to open-ended questions eliciting information about the last time the pharmacist provided spiritual care to a patient, indicators that a patient needs spiritual assistance, and religious beliefs thought to be harmful. Data were content analyzed by two investigators. **Results:** Although 251 responded to the survey, only 141 pharmacists responded to the open questions. Most respondents were female (58%), Christian (70%), religious (73%), attended religious services (78%), and practiced in an urban setting (56%). Themes observed indicated that these pharmacists prayed with and for patients, talked to patients about God and religion, referred patients to spiritual services, were sensitive to patients’ spiritual or religious beliefs, and listened to patients’ expressions of spirituality. Some respondents, however, avoided religious conversations and requests; some also reported unwillingness to provide spiritual care to patients. Pharmacists had limited education, knowledge and awareness about spiritual care. **Conclusions:** Pharmacists in this sample reported diverse perspectives about spiritual care that ranged from acceptance to rejection of spiritual care in patient care. Pharmacists are not fully engaged in providing spiritual care because of several challenges including limited education and training on spiritual care. Scholarly inquiry is needed to examine how pharmacists can best provide spiritual care in pharmacy practice.

**Exploring Cognitive Apprenticeship in Didactic Pharmacy Education**

Exploring the Impact of ACPE Certification on Pharmacy Education outside the United States

Omar F. Attarabeen, Marshall University School of Pharmacy, Fadi Alkhateeb, South College, Reza Karimi, Pacific University Oregon.

Objective: To explore the impact of the Accreditation Council for Pharmacy Education (ACPE) certification on the quality of pharmacy education among ACPE-certified pharmacy programs outside the United States (US). Methods: This cross-sectional study was based on highly structured, standardized interviews. A predetermined questionnaire was designed to include both quantitative and qualitative items. A total of 15 pharmacy colleges and schools outside the US have received the ACPE certification as of April 2020. Online live interviews were scheduled from May to July 2020 via Zoom, and lasted approximately 45 minutes each. The questionnaire measured the impact of ACPE certification on the operation and structure as well as financial resources of the certified programs. A few open-response items allowed participants to further explain in case they thought the ACPE certification did not improve certain areas in their programs. Results: Administrators from 13 colleges and schools participated in this study (87% respondent rate). The participants had multiple views on how different processes have improved due to the certification, most notably preceptor development, assessment, student learning in both didactic and experiential areas, refining strategic planning, and communications with various stakeholders. However, the majority of participants agreed the ACPE certification had a limited impact on financial resources within their certified programs (the certification had a lower impact on faculty salaries, funds for faculty to attend academic and pharmacy conferences, and receiving extramural funding). Conclusions: Despite being confined to little or no change in certain aspects, all the interviewees believed the ACPE certification had a positive impact on the quality of their programs. The ACPE certification of pharmacy programs may grow more popular in the future.

Exploring the Reactions of the Users on Using Hydroxychloroquine for COVID-19 Treatment via Twitter

Uyen Le, California Northstate University College of Pharmacy, Tuan Tran, California Northstate University College of Pharmacy, Thuy Do, University of Massachusetts, Dong Nguyen, Saolasoft Inc.

Objective: To analyzes the reactions and opinions on using “Hydroxychloroquine” (HCQ) for COVID-19 treatment. Methods: We developed a computer program that collected more than 164,000 tweets having “Hydroxychloroquine” keyword posted on Twitter in 2020. The data was analyzed using a text mining approach to reveal the reactions and opinions of users on using HCQ for COVID-19 treatment. We further linked the timeline of tweets, Google keyword searches, and CDC prescription purchases to identify the reaction pattern of users over time. Finally, we mapped the keyword search frequencies to the users’ geographical location to reveals how misinformation was disseminated in the space domain. Results: Our analysis showed a strong association in the number of tweets and reactions in response to the misinformation of HCQ for COVID-19 treatment (more than 15,000 retweets). Our tweet sentiment analysis showed that a significant number of users advocated for the use of HCQ for treating COVID-19 (more than 500,000 favorites) regardless of unjustified information. Additionally, our analysis showed that there was a strong
association between the number of tweets and keyword searches on Google, showing strong interest in using the drug for treatment. Furthermore, data comparison with the new HCQ prescriptions from the CDC (increase 81.3 times in March 2020) matched well with the tweet patterns. Finally, the geographical mapping of the keyword searches showed significant interest in searching HCQ in specific states. **Conclusions:** Using the case of HCQ, our findings suggested that misinformation can get a lot of attention on social networks, posing significant threats to the health of the community. Public health policymakers can utilize the tool to proactively take actions to protect the community.

**Factors and Career Motivators Associated with Interest in the Pharmacy Profession Among HBCU Pipeline Students**

Mary K. Awuonda, Howard University, La'Marcus Wingate, Howard University, Beverly Mims, Howard University, Earl Ettienne, Howard University, Malaika Turner, Howard University, Tamara McCants, Howard University, Tawanna Terry, Howard University College of Pharmacy.

**Objective:** To evaluate factors and career motivators associated with interest in the pharmacy profession among HBCU pipeline students. **Methods:** A cross-sectional study of pipeline students participating in the National Workforce Diversity Project at an HBCU was conducted among participating students from 2016 to 2019. Descriptive statistics of socio-demographic variables and career motivating factors were collected. Bivariable analysis on career motivating factors and interest in the pharmacist career was conducted. All analyses were completed using SPSS version 27 at an alpha of 0.05. **Results:** A total of 79 students were included in the analysis. Of them, 56 (70.9%) were interested in a career as a pharmacist. The majority of the participants were female and self-identified as Black/African American. The top motivating career factors reported as important/extremely important among the students interested in becoming pharmacists were job security (92.9%), improving people’s lives (98.2%), spending time with family (92.9%), giving back (89.3%), and using what you learned in school (92.9%). A statistically significant association was found between working with people as a career motivator and career interest in becoming a pharmacist (p = .002). No statistically significant effect was found between having a mother or father working as a health professional and career interest in becoming a pharmacist (p = .17). **Conclusions:** The study’s findings demonstrate the importance of job security, family/society benefit, using education, and working with people as top motivating factors for minority students interested in becoming pharmacists. Such factors can be important to consider as pharmacy schools contemplate additional recruitment strategies to combat declining enrollments.

**First-Professional Year Student Preferences for Testing in a US Health Care Systems Course**

Duska M. Franic, The University of Georgia, Russ Palmer, The University of Georgia, Michael J. Fulford, The University of Georgia.

**Objective:** The use of online learning and subsequent online testing has expanded rapidly in pharmacy programs across the United States. Numerous studies have been published comparing online learning with traditional methods in pharmacy. However, no such studies have been published in pharmacy. This study’s objective was to compare first-professional year student preferences for computer-based testing (CBT) versus traditional paper-and-pencil testing (P&P) for a required social and administrative pharmacy class. **Methods:** First-professional year students enrolled in a required 3-credit US Health Care Systems class were invited to complete one survey at the end of the semester to assess their preferences for testing. Part one of the survey was quantitative consisting of 14-items using 5-point Likert scales (1 = poor and 5 = excellent); while part two was qualitative consisting of four open-ended items. **Results:** Of the 99 percent of the class (138 of 139) completing the survey, 79% preferred CBT, nine percent had no preference, while six percent preferred P&P, while the remaining six percent stated it depended on what was being tested. Ninety-one percent of students did not perceive the testing method to impact their grades. Students preferred CBT over traditional P&P as a convenient testing method (mean 4.73 vs. 3.40, p < .001), providing immediate feedback (mean 4.87 vs. 1.91, p < .001), and as a more effective testing method (mean 4.57 vs. 3.96, p < .001). **Conclusions:** First-professional year students preferred CBT over traditional P&P for a social and administrative science class, with the method of testing was not perceived by students to impact grade. This finding is timely, given the recent required transition of all pharmacy classes and subsequent testing to an online format due to the COVID-19 pandemic.

**Gender Inequity Perceptions among Social and Administrative Sciences Pharmacy Faculty**

Elizabeth Unni, Touro College of Pharmacy-New York, Lourdes G. Planas, University of Oklahoma College of Pharmacy, Terri Warholak, The University of Arizona College of Pharmacy, Jamie C. Barner, The University of Texas at Austin, Michelle A. Clark, Nova Southeastern University College of Pharmacy, Radhika Devraj, Southern Illinois University Edwardsville, Tyan F. Thomas, University of...
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**Global Health Initiatives for Continuing Quality Improvement of Pharmacy Education**


**Objective:** The main purpose of this poster presentation is to examine effective strategies for building successful global partnerships for pharmacy education. Specifically, to highlight approaches for overcoming challenges for building global partnerships and share “best practices” and “lessons learned” from a panel of experts on global education. Moreover, the presenters will share successful national and global assessment strategies for implementing the Center for the Advancement of Pharmacy Education (CAPE) 2013 Outcomes in the curricula. Lastly, the poster will include examples from the literature and provide resources that can foster opportunities for global collaboration for continuous quality improvement of (CQI) of pharmacy education globally.

**Methods:** The leadership team at the AACP Global “Pharmacy” Education (GE) Special Interest Group (SIG) collaborated with a panel of experts on developing, presenting, and assessing the outcomes of the 2021 Inaugural International Webinar Series. These webinars were presented to about 500 global participants, including AACP members and non-members.

**Results:** The main topics of these webinars included the following: 1. Transition to a Pharm.D. Model, 2. Developing Global Partnerships for Pharmacy Education, 3. CAPE Educational Outcomes linked with International Pharmacy Education. The webinars were well received by the “live” participants. In addition, the recording of all the webinars were posted on the AACP Connect for all members. **Conclusions:** Approximately 200 participants joined AACP as new members after the webinars. Moreover, AACP established the Council of Deans “International Collaborations Taskforce (ICTF).” At the AACP Interim Meeting, the ICTF presented their progress report. The final recommendations for the AACP Board of Directors will be presented at the 2021 AACP Annual Meeting.


Katie F. Leslie, *Sullivan University.*

**Objective:** Learners within the didactic curriculum are often assigned course culminating group projects. Group presentations often lack cohesion, with 1-2 students dominating the conversation. The online learning environment presents additional challenges for facilitating student-led content. The objective of this project was to pilot a virtual group poster presentation assignment in the first-year of an accelerated PharmD program. **Methods:** Learners within a Public Health course were assigned to groups of 5-7 members to develop an evidence-based poster presentation on a public health issue in which pharmacists play a mitigation role. Each group hosted an online “room” where students individually presented the poster during 8 (10-minute) presentation rounds, each student presenting at least once.
When not presenting, students attended other posters and completed peer evaluations for feedback (did not affect grades). Eight faculty graders rotated through rooms utilizing rubrics to evaluate presentations in the weighted domains of background (30%), causal determinants (15%), intervention strategy (40%), and delivery (15%), each measured on a 5-point Likert-type scale. Final team grades were calculated as an average of these scores, excluding the lowest score. **Results:** Presentation content varied, including topics such as pharmacist-initiated tobacco cessation, increasing immunization rates in minority communities, harm reduction in people who inject drugs, and tertiary prevention through hypertension management. Mean team presentation scores were background 4.69 (range 4.33-5.0), causal determinants 4.49 (4.0-5.0), intervention strategy 4.35 (3.83-4.86), and delivery 4.34 (3.83-4.83), with an overall group weighted average of 4.47 (4.03-4.84). **Conclusions:** Learners performed well on the assignment, integrating course concepts and evidence-based interventions. Virtual posters are a unique alternative to traditional group projects with implications for use beyond the current environment.

**Health Behaviors and Study Habits Among PharmD Students and Pharmacy Graduate Students During Remote Learning**

Chenyu Zou, Auburn University, Brent Fox, Auburn University, Julaine Fowlin, Vanderbilt University, Kimberly Garza, Auburn University.

**Objective:** Auburn University Harrison School of Pharmacy (HSOP) transitioned from on-campus instruction to remote learning in March 2020 due to the COVID-19 Pandemic. This project aimed to assess the impact of remote learning on PharmD students’ and graduate students’ health behaviors and work or study habits. **Methods:** An online survey was distributed by email to 645 PharmD and graduate students in July to understand the effects of remote learning on their mental health, health behaviors, and school-related activities. Descriptive statistics were used to analyze quantitative data (SAS 9.4 and Excel). Thematic analysis was used to analyze qualitative data derived from nine open-ended questions. **Results:** 118 PharmD and 23 graduate students responded to the survey. Most indicated feeling nervous, anxious, or on edge during remote learning. Sixty-one percent of graduate students agreed that they felt more down or depressed, compared to only 42% of PharmD students. Some graduate students also reported social isolation and anxiety, as their families lived in other states or countries. Graduate students did not have access to their research labs, but they had more time to finish course assignments and engage in non-work hobbies. In comparison, most PharmD students indicated no commute to class and improved quality time with family. However, less time for exercise and social activities increased their stress level. Time management and household distractions were reported as key factors influencing productivity for both groups. **Conclusions:** HSOP PharmD and Graduate students were both positively and negatively affected by the transition to remote learning, but graduate students reported more difficulty adapting. Findings suggest that it is critical to develop interventions to address the health and productivity challenges, particularly for graduate students.

**High Perceived Stress among Pharmacy Students Amid the COVID-19 Pandemic**

Gladys Ekong, Western New England University, Ama Achiamaa, Western New England University.

**Objective:** High levels of stress can be triggered by unexpected events, which can lead to poor academic performance and mental health conditions. The COVID-19 pandemic led to unprecedented changes in teaching methods for students. We assessed the students’ perception of stress due to changes in course content delivery and the COVID-19 pandemic in two cohorts of second year pharmacy students. **Methods:** Cross-sectional study. Self-reported data on perception of stress was collected via the validated Perceived Stress scale (PSS-10) in April 2020 for the Spring Cohort (46 participants) and November 2020 for Fall Cohort (34 participants). The total PSS-10 score is interpreted as 0-7 = very low health concern, 8-11 = low health concern, 12-15 = average health concerns, 16-20 = high health concern, 21+ = very high health concern. Descriptive statistics was applied and independent t-test at a significance level of p < .05. **Results:** Eighty pharmacy students participated in the study (90.91% response rate). The average PSS-10 score for all participants was 22.1 (SD = 6.88), range 2 to 34. A higher average score was observed for the Spring Cohort, 23.3 (SD = 6.91) compared to Fall Cohort, 22.5 (SD = 6.65). Findings on the t-test did not indicate a statistically significant difference between the two cohorts (t(77) = -1.64, p = .104). **Conclusions:** The average PSS-10 score exceeded the value deemed as “a very high health concern” in the overall sample and cohorts. High perceived stress levels may negatively impact academic performance and mental health. Study findings support the need for wellness programs that target stressful events for students.

**Identification of Key Business of Healthcare Topics Needed Within the PharmD Curriculum**

Morbitzer Kathryn, University of North Carolina at Chapel Hill, Jacqueline McLaughlin, University of North Carolina
Identifying Adverse Effects of Energy Drink Consumption via Social Media

Tuan Tran, California Northstate University College of Pharmacy, Diana Cao, Marshall B. Ketchum University College of Pharmacy, Uyen Le, California Northstate University College of Pharmacy, Dong Nguyen, Saolosoft Inc, Anh Nguyen, Saolosoft Inc.

Objective: The safety and health impact of energy drinks (EDs) in the real-world setting has not been well-defined. This study aims to identify the adverse effect profile of ED and their relationship with coingestants using social media.

Methods: A keyword search for tweets relating to energy drink adverse effects was conducted from August through November 2019 using a computer program. Data preprocessing was performed to filter out noise, and good-quality tweets were evaluated to identify adverse effects after ED consumption. The frequency of adverse effect mentioning and their relationship with coingestants were evaluated using computer program text mining. Both descriptive and inferential statistics were conducted to gain insights into consumers’ experience with ED usage.

Results: From 457,314 collected tweets, we identified 2,403 good-quality tweets, with 26 (1.08%), 463 (19.27%), and 1,718 (71.49%) tweets referencing to severe ED adverse effects, less severe ED adverse effects, and general discussion, respectively. There were 196 (8.15%) tweets written in foreign languages that were discarded from the analysis. Coingestant is strongly associated with the experience of ED adverse effect (p<.05). Of the 489 tweets associated with ED adverse effects, alcohol and coffee were identified as the most common coingestants (51 and 43 adverse effect incidents, respectively). Seven adverse effect incidents were associated with consuming ED with medications. Further, text mining revealed that “anxiety” is the most common adverse effect experienced by ED consumers.

Conclusions: Utilizing public tweets is a novel approach to identify ED adverse effects in the real-world setting. Insights gained from social media may assist public health policymakers as they move to improve policy and guidance around ED consumption.

Identifying the Changes of Team-Based Learning at Fisch College of Pharmacy Through a Survey Study

Rachel Koshy, The University of Texas at Tyler, Aladrian Black, The University of Texas at Tyler, Frank Yu, The University of Texas at Tyler, Tianrui Yang, The University of Texas at Tyler, Jessica Wooster, The University of Texas at Tyler.

Objective: This survey study aims to identify academic and professional performances of virtual TBL based on the perspectives of students and faculty at Fisch College of Pharmacy.

Methods: Data Collection: The survey was available for 10 days. Survey items included questions of multiple-choice, Likert scale, and fill in the blank. This was to assess the perspectives of both students and faculty regarding the changes in TBL format. Results: Out of 168 responses, 164 students gave informed consent. Out of 20 responses, 20 faculty members gave informed consent. The following results will resemble responses from students and faculty members regarding their previous online experience, preferred class format, confidence in student-instructor engagement, challenges they faced, and improvements that could be made. Posting lecture videos and
solutions to problems online was voted for the most at 23.14% for the improvement of online TBL classes. Faculty stated that among the changes they implemented to deliver their course in online/hybrid format they had increased use of breakout rooms at 40.00%. Three out of nine open ended responses suggested holding students accountable for increased participation by enforcing more strict attendance rules for online TBL. Results are limited to Fisch College of Pharmacy. Conclusions: Faculty and students do not feel engaged in online TBL formatting. Changes were suggested to increase engagement by implementing more breakout room sessions and holding students more accountable. Students believe that posting canvas lectures online and having students come together and complete cases then posting the answers afterward can help make the process of online learning more engaging for students and faculty. Further studies can look into assessing student grade performance with being online fully versus hybrid format as well.

Impact of Distance Learning and Assessments on Student Pharmacist Performance
Julie Akers, Washington State University, Maggie Godsey, Washington State University.
Objective: To determine if virtual assessments during the COVID-19 pandemic impacted exam scores in comparison to face-to-face in Pharmacy 564: Pharmacy Law and Regulatory Affairs. Methods: Assessment scores from April 2018-February 2021 were collected from ExamSoft. Scores were categorized based on the assessment setting: face-to-face or virtual. Within virtual assessments, scores were separated by Spring 2020 and 2021. A two-tailed unpaired t-test via Microsoft Excel was used to evaluate statistical significance. A p<.05 was considered significant. Results: A total of 1757 assessment scores were taken from 2018-2021 in Pharmacy Law and Regulatory Affairs. Of the 1757 scores, 1118 were face-to-face and 639 were virtual. Of the 639 virtual scores, 324 were from Spring 2020 and 315 were from Spring 2021. No statistical difference was found between aggregate face-to-face and virtual assessments. In subgroup analysis, 2020 virtual mean scores were statistically higher than 2020 face-to-face. In addition, virtual Spring 2020 mean scores were statistically higher than mean scores from virtual Spring 2021. Conclusions: While no significant difference between aggregate face-to-face and virtual assessments was observed, subgroup analysis identified higher mean scores in Spring 2020 after transitioning to distance learning compared to face-to-face earlier in the semester. As students continued in the distance model into 2021, analysis comparing 2021 virtual assessments to Spring 2020 virtual assessments showed a decrease in mean scores. This reduction in virtual scores overtime could be due to several factors, including distractions in the testing environment, digital fatigue, and stress due to awareness of virtual exam proctoring.

Impact of Real-World Patients on Empathy Among Pharmacy Students
Troy D. Kish, Long Island University, Brooke Fidler, Long Island University, John Lonie, Long Island University.
Objective: To evaluate how testimonials from real-life patients influences student empathy towards patients with substance use disorder and cancer. Methods: At the start of the course, students completed a baseline Kiersma-Chen Empathy Scale for both patients with substance abuse and patients with cancer. A baseline Medical Condition Regard Scale was also collected for patients with substance abuse. Following each presenter, students were asked to complete a follow-up survey to assess the impact of the talk on their attitudes towards these patient populations. All survey results were examined using descriptive statistics. Descriptive results are reported as the mean and standard deviation (SD) or median (range) and the Paired Student’s T-test was used to assess for statistical differences. Students were given the choice to participate in this study and all survey data collected contained no identifying information. This study was approved by the university institutional review board prior to initiation. Results: A total of 99 and 104 students completed baseline and follow-up surveys for substance abuse and cancer, respectively. Using the KCES, there were significant improvements in 10 of the 15 questions for substance abuse and 6 of the 15 questions for cancer. There were significant improvements in 6 of the 11 questions from the MCRS. Conclusions: Incorporation of real-life patients into a therapeutics course significantly improved student’s empathy toward patients with very different diseases. This strategy may be useful to improve student’s empathy in a variety of diseases before entering their Advance Pharmacy Practice Experiences (APPEs).

Impact of the COVID-19 Pandemic on Administrative Aspects of US Pharmacy Schools
Rajkumar J. Sevak, University of the Pacific, Reina Sanz, University of the Pacific, Rajul Patel, University of the Pacific, Kate O’Dell, University of the Pacific.
Objective: The coronavirus (COVID-19) pandemic has markedly affected higher education in the US. Administrative aspects of pharmacy education have likely undergone substantial changes due to the pandemic. However, to-date, no study has summarized such changes at pharmacy schools across the nation. We conducted a survey of the US
pharmacy school administrators to evaluate the pandemic’s impact on administrative aspects of pharmacy schools. **Methods:** A web-based survey was sent to US pharmacy school administrators (Dean, Assistant/Associate Dean, Department Chair/Vice-Chair or Director) in August 2020. The survey included questions assessing the pandemic’s impact on activities and adaptations at their schools. Descriptive statistics describe the pandemic’s impact on administrative aspects of pharmacy schools. This study was approved by the University’s Institutional Review Board. **Results:** Of the 1,068 individuals who participated in the survey (17.3% response rate), 179 self-identified as administrators. Over 90% of administrators indicated experiencing an increased workload due to the pandemic. The financial well-being of their school/university was negatively impacted (73.8%-86.5%), leading to employee hiring freezes, operating budget cuts, and reductions in facilities construction and maintenance budgets. The COVID-19 pandemic negatively impacted administrative aspects (69.7%-83.8%), which included managing faculty, staff, school and course workloads, on-campus research activities, and overall financial or budget planning. Most administrators (66.8%-88.4%) indicated that the didactic, experiential, and/or skill-based teachings and assessments were negatively impacted. Additionally, 78.5% of administrators indicated worsening mental health of their students due to the pandemic. **Conclusions:** Present findings indicate negative effects of the COVID-19 pandemic has had on administrative aspects, and resultant adaptations, of US pharmacy schools.

**Impact of the COVID-19 Pandemic on US Pharmacy School Faculty**


**Objective:** The coronavirus (COVID-19) pandemic has profoundly impacted healthcare education, requiring distance virtual teaching and impeded research activities by faculty members. However, to-date, no study has evaluated how pandemic has affected US pharmacy school faculty members’ activities. This study examined the pandemic’s impact on US pharmacy school faculty members’ teaching, research and service activities. In addition, this study sought to understand the mental well-being of US pharmacy school faculty. **Methods:** A web-based survey was sent to US pharmacy school faculty in August 2020. The survey included questions to evaluate the pandemic’s impact on the teaching, research, and service activities and mental well-being of faculty. Descriptive statistics examine the pandemic’s impact on faculty member activities. This study was approved by the University’s Institutional Review Board. **Results:** Of the 1,068 individuals who participated in the survey (17.3% response rate), 759 (71.1%) self-identified as faculty. Approximately 72.3% of faculty who completed the survey reported an increased teaching workload. A majority of faculty indicated that the COVID-19 pandemic negatively impacted their teaching delivery (61.7%), teaching satisfaction (55.1%), and research productivity (56.8%). Moreover, many faculty indicated that the COVID-19 pandemic worsened the mental well-being of faculty (63.8%) and students (81.6%). **Conclusions:** Study findings underscore the negative impact of the COVID-19 pandemic on the teaching, research and mental well-being of US pharmacy school faculty. Targeted interventions are needed that adequately address US pharmacy school faculty activities and mental well-being.

**Lessons Learned from a Pharmacokinetics Course Adaptation in Response to the COVID-19 Pandemic**


**Objective:** The COVID-19 global pandemic forced all levels of education to modify their normal modes of instruction to comply with efforts to lessen the spread of disease. This abstract illustrates changes to a four-credit hour pharmacokinetics course redesigned to a hybrid learning model in compliance with COVID-19 social distancing restrictions. **Methods:** Prior to the COVID-19 pandemic, the four-credit hour pharmacokinetics course consisted of two 65-minute in-person lectures per week and a 120-minute weekly group active learning component. In response to the pandemic, the pharmacy faculty agreed on a new hybrid delivery strategy for four-credit hour courses. Students were broken into three groups – each group with different on-campus active learning days. All didactic course content was provided asynchronously in Canvas in advance of the active learning day(s). Students used group meeting software in the classroom to complete group work while maintaining social distancing. **Results:** The hybrid instructional model was a novel concept for most pharmacy students in terms of preparation and completing group pharmacokinetic cases and problems based on the online content. Added stressors of outside work and family responsibilities created by the global pandemic made it difficult for many students to keep up with the course material. Other highlighted issues included incomplete comprehension of pharmacokinetics calculations in an asynchronous format compared to face-to-face guided instruction, technology obstacles, and ensuring effective group dynamics while respecting social distancing requirements in the classroom. **Conclusions:**
Insights gained through student feedback will be used to help improve student learning outcomes in future hybrid-taught pharmacokinetics course offerings.

**Lessons Learned: Using Design Thinking Principles to Identify Best Practices of Pharmacy Learning Communities**

Faustina T. Hahn, University of North Carolina at Chapel Hill Eshelman School of Pharmacy, Jacqueline McLaughlin, University of North Carolina at Chapel Hill, Jackie M. Zeeman, University of North Carolina at Chapel Hill.

**Objective**: Embracing a design thinking process (eg, Ideate, Prototype, Test), the UNC Eshelman School of Pharmacy sought to advance faculty and student engagement in the multi-dimension learning environment (ie, Ideate). This ideation resulted in the implementation (ie, Prototype) of Pharmacy Learning Communities (PLCs) in Fall 2019. The PLCs included faculty coaches, first-year-student (PY1) advisees, and third-year-student (PY3) peer mentors. The purpose of this study was to explore (ie, Test) user experiences of PLCs and infuse these learnings in future refinement of the PLCs. **Methods**: Focus groups were conducted to identify PY1 advisees’, PY3 peer mentors’, and faculty coaches’ feedback on PLC strengths and opportunities for improvement. Quotes were extracted, analyzed using inductive coding, and themes were identified across and within each of the three groups. The Office of Curricular and Student Affairs utilized participant recommendations (ie, Ideate) to refine the PLCs (ie, Prototype). **Results**: All participants enjoyed their PLC experience and identified the multiple perspectives of faculty and PY3s as a strength of PLCs. Participants commented that PLCs fostered relationships between stakeholders (eg, faculty, staff, students) and identified opportunities to further enhance these relationships (eg, one on one sessions with faculty, social sessions). Participants also provided feedback on the PLC curriculum topics, including more content on professional development, wellness, and open forums. **Conclusions**: These findings identified best practices of PLCs and informed opportunities for continued ideation and prototyping to enhance the PLC experience. Future research should investigate perceptions of these changes and explore the longitudinal effects of PLCs.

**Lifestyle Modification to Promote Student Empathy and Wellness**

Megan N. Willson, Washington State University, Lauren Marcath, Washington State University, Kimberly C. McKeirman, Washington State University.

**Objective**: To determine the impact of a one-week wellness lifestyle modification on student empathy and wellness. **Methods**: A mixed methods approach was used to explore empathy and improve student wellness through a one-week assignment. Students selected a wellness focused lifestyle modification. The Jefferson Scale of Empathy—Health Profession Students version was completed before and after the activity. Students completed two guided reflections on the successes and challenges of completing the activity, one midway and the other at the conclusion of the activity. The quantitative pre- and post-activity empathy self-assessment data was exported from Qualtrics into Microsoft Excel and was analyzed quantitatively after all personal identifying information was removed. First level and second level coding was completed. The Mann-Whitney U test was used to determine p-values. **Results**: One-hundred twenty students completed the pre-activity empathy self-assessment and 121 students completed the post-activity empathy self-assessment. Statistically significant changes from pre- to post-activity empathy self-assessment for five of the questions. Change in responses were non-significant for the remaining questions. Coded themes include empathy for patients, friends, or relatives; individual motivation to improve health; individual motivation for self-improvement; external motivation for improvement; and lifestyle factors. **Conclusions**: Empathy is a critical skill for future pharmacists. Motivation for behavior change and self-care provides valuable insight on patient struggles with lifestyle modifications. Use of a short wellness lifestyle modification within the curriculum resulted in improved empathy and provided students with motivation to improve personal health and wellness. Student reflections identified improvements in both physical and mental health.

**Medication Therapy Management and Diabetes Self-Management Education and Support in Texas Colleges/Schools of Pharmacy (TXCSOPs)**

Jamie C. Barner, The University of Texas at Austin, Leticia Moczygemba, The University of Texas at Austin, Sharon Rush, The University of Texas at Austin, Paige Travillion, The University of Texas at Austin, Michaela Clague, The University of Texas at Austin.

**Objective**: As part of a Centers for Disease Control and Prevention grant to enhance pharmacist-provision of medication therapy management (MTM) and diabetes self-management education services (DSMES) in Texas, the goal of this study was to assess curricular content regarding: 1) structure of MTM training, 2) diabetes and DSMES training, and 3) feasibility of expanding MTM training and incorporating DSMES accreditation training. **Methods**: This
cross-sectional online survey was emailed to faculty responsible for teaching MTM at all (N = 9) TXCSOPs. An introductory email and virtual informational meeting preceded the survey, which was followed by two reminder emails. The survey instrument assessed: MTM curricular training (20 items) and diabetes training (6 items), in addition to TXCSOPs characteristics. Response scales varied with feasibility measured on a 10-point scale (1 = not feasible; 10 = very feasible). Data were analyzed using descriptive statistics. **Results**: All 9 (100%) TXCSOPs responded to the survey. Most incorporated MTM in the Advanced Pharmacy Practice Experiences during the P4 year (N = 6; 66.7%) and required completion of the American Pharmacists Association MTM certificate program (N = 7; 77.8%). MTM was taught utilizing lectures (N = 9; 100%), case studies (N = 8; 88.9%), and real/proxy patients (N = 7; 77.8%). Most (N = 6; 66.7%) would like to increase the number of MTM training sites and include more training on MTM documentation (N = 6; 66.7%), billing (N = 5; 55.6%), and provider engagement (N = 5; 55.6%). While less than half (N = 4; 44.4%) offered diabetes electives, only one (11.1%) exposed students to DSMES. The DSMES-related activities with the highest feasibility were identifying tools to collect and analyze clinical/process outcomes (8.0 ± 2.6) and identifying community resources for diet/exercise (7.7 ± 2.4). **Conclusions**: Incorporating training in the above areas may better position future pharmacists regarding MTM compensation, engaging providers, as well as increasing the number of accredited DSMES pharmacies.

**Multidisciplinary Integration and Assessment of the Pharmacists’ Patient Care Process Across the Curriculum**

Juanita A. Draime, Cedarville University, Aleda M. Chen, Cedarville University, Amanda Wilson, Cedarville University School of Pharmacy, Zachary Jenkins, Cedarville University, Brenda Pahl, Cedarville University, Denise Jean-Louis, Cedarville University, Alexandra Hintz, Cedarville University, Justin Cole, Cedarville University School of Pharmacy.

**Objective**: The inclusion of the Pharmacists’ Patient Care Process (PPCP) into the accreditation standards affords an opportunity to integrate multiple disciplines throughout the curriculum and demonstrate the importance of all disciplines in patient care. Thus, the objective of this project was to retrospectively (1) describe student outcomes in applying the PPCP throughout a PharmD curriculum using skills-based assessments and (2) compare differences in final pre-Advanced Pharmacy Practice Experience (APPE) outcomes across cohorts. **Methods**: Integration efforts of the PPCP starting in 2016 included faculty and staff development and workshops, inclusion in most courses across the curriculum, and collaborative efforts between departments. Standardized rubrics were implemented to assess student progression. Assessment data were reviewed annually in order to drive change (80% considered minimum competency). Data from six cohorts of students were compiled to address the objectives from a summative P1 counseling activity, P2 clinical case note, P3 clinical case note, and P3 objective structured clinical examination (OSCE) and examined for significant differences. **Results**: Students demonstrated competency in most steps of the PPCP (>80%), particularly students in later cohorts. The Plan/Implement steps had the lowest scores (<80%) but became significantly higher (>80%) in later years (p = .001). The final cohort of students met competency in all PPCP steps, with the highest average score on their summative PPCP pre-APPE assessment (88.24 ± 9.39). **Conclusions**: Integration efforts related to the PPCP resulted in improvements in some steps of the PPCP, particularly the Plan/Implement step. With repetition known to improve skills, the importance of a common framework for providing patient-centered care, and the importance of student understanding of the foundational sciences, this curricular integration demonstrates a successful approach to integrate the PPCP.

**National Survey of the Implementation and Assessment of the Pharmacists’ Patient Care Process**

Aleda M. Chen, Cedarville University, Margarita DiVall, Northeastern University, Michael J. Gonyeau, Northeastern University, Mary Kiersma, Accreditation Council for Pharmacy Education, Teresa A. O’Sullivan, University of Washington, Jeannine Conway, University of Minnesota, Robin Zavod, Midwestern University.

**Objective**: The Pharmacists Patient Care Process (PPCP) was incorporated into the 2016 pharmacy accreditation standards; thus, institutions must determine when and how to integrate and assess student ability to implement the PPCP. The objective of this project was to examine the integration and assessment of the PPCP in curricula along with faculty participation in teaching the PPCP across the academy. **Methods**: A Qualtrics-administered survey was developed and distributed to 141 pharmacy institutions accredited or in the accreditation process. Items were developed by the research team and piloted for readability before distribution. Reminders were utilized to maximize response rates. **Results**: With a 70% response rate (N = 99), programs represented were inclusive of both private and public institutions. 80% of programs had intentional teaching and assessment plans for the PPCP. Most programs integrated the PPCP across multiple years, with 49% integrating throughout the didactic
Organizational Readiness to Implement Community Pharmacy-Based Opioid Counseling and Naloxone Services: A Scoping Review

Lindsey Hohmann, Auburn University, Brent Fox, Auburn University, Haley Phillippe, Auburn University, Karen Marlowe, Auburn University, Chris Correia, Auburn University.

Objective: To explore existing practice models and opportunities surrounding community pharmacist-delivered opioid counseling and naloxone (OCN) services in the U.S., with the goal of enhancing organizational readiness and improving patient access. Methods: A scoping literature review was conducted. English-language articles published in peer-reviewed journals from 01/2012-12/2020 were sought via PubMed, CINAHL, IPA, and Google Scholar using permutations of terms including “pharmacist/pharmacy,” “opioid/opiate,” “naloxone,” “counseling,” “program,” “resource,” “process,” “intervention,” “financial,” “satisfaction,” “develop/development,” and “implement/implementation.” Original articles reporting resources (inputs), processes, and programmatic outcomes (uptake/delivery, interventions made, financial models, satisfaction) of pharmacist-delivered OCN services in community (retail) settings were retained. Results: Nine articles describing 7 unique studies were included. Studies primarily used retrospective cohort designs and were published from 2017-2020. Articles described 7 broad program elements/themes: 1) interprofessional collaboration (n=1); 2) one-on-one patient education (n=7); 3) group education sessions (n=1); 4) provider education (n=2); 5) opioid misuse screening tools (n=3); 6) naloxone recommendation/dispensing (n=7); and 7) opioid therapy management (n=2). All studies utilized in-house (versus outsourced) pharmacists to perform OCN services; utilization of pharmacy technicians (n=1), student pharmacists (n=2), and pharmacy residents (n=1) was also reported. Pharmacists screened/counseled from 11-1,700 patients and provided 11-234 doses of naloxone. Limited implementation cost or patient/provider satisfaction measures were reported. Conclusions: This review may serve as a guide for community pharmacists to implement OCN services in their own practices, highlighting areas for organizational enhancement. There is opportunity for community pharmacists to utilize ancillary pharmacy staff, including technicians, students, and residents to improve OCN workflow efficiency. Interprofessional collaborations and group education sessions are little-utilized program elements that could increase uptake. Future studies should clarify OCN program implementation costs and patient/provider satisfaction.

Peer-Reporting of Academic Dishonesty in Classroom and Online Examinations

Myo-Kyoung Kim, University of the Pacific, Rachelle Hackett, University of the Pacific, Miki Park, University of the Pacific, Justin Low, University of the Pacific.

Objective: The purpose of the study is to investigate the prevalence and experience of peer-reporting of academic dishonesty amongst pharmacy students and to explore consequences of peer-reporting to peer-reporters and academic integrity violators. Methods: An anonymous online survey was administered through email invitations sent to students in approximately 62 pharmacy schools throughout the US. To ensure sufficient classroom and online examination experience, students with at least two semesters of pharmacy school experience were included. The 34-item survey included checks for validity as well as social desirability, leaving 271 valid cases for the quantitative and qualitative data analysis. Results: Fifty-six of 271 respondents (20.7%) self-reported engagement in academic dishonesty. 144 respondents (53.1%) and 189 (69.7%) reported direct and indirect observation of classmates’ cheating, respectively. However, only 25 respondents reported classmates’ cheating (17% of direct observers, 13% of indirect observers, and 9.2% of total study participants). Specifically larger proportions (p<.001) of third-year (24.5%) than second-year students (5.5%), female (12.3%) than male students (2.8%), and married (29.2%) than single students (7.9%) reported cheating. Reporters versus non-reporters did not differ (p>.05) in ethnicity, previous degree, future career plan, age, or GPA. Common reasons for not reporting include reluctance to cause peers to receive punishment (22.2%), fear of retaliation (20%), and insufficient information about how to report (20%). After peer-reporting, 56% of peer-reporters experienced emotional anxiety. However,
Pharmacy Resident Perceptions of Completing a Teaching Certificate Program During COVID-19

Alicia P. DeFalco, South College School of Pharmacy, Laura A. Schalliol, South College, Courtney Jurgens, South College.

Objective: To assess the impact of education delivery modifications resulting from COVID-19 on pharmacy resident perceptions of delivering an effective academic experience to pharmacy students through completion of a teaching certificate program. Methods: Pharmacy residents completing the teaching certificate program were administered a post-survey. A summary of the responses will be completed to assess if utilizing a hybrid classroom model impacted resident impressions on teaching certificate completion and provision of pharmacy education. Results: Sixteen pharmacy residents are currently enrolled in our teaching certificate program. Nine have been issued a post-survey, and 7 responses have been received. The remaining seven residents will be surveyed after completion of their didactic requirement in the Spring. Based on preliminary results, 43% of participants strongly agreed and 57% agreed they were confident in their abilities to deliver a hybrid lecture, while 29% strongly agreed and 71% agreed they were able to educate students equally as effective in-person and virtually. 29% strongly agreed, 14% agreed, 43% were neutral, and 14% disagreed that the impact they could make on a student is to the same extent, regardless of content delivery method. 43% strongly agreed, 43% agreed, and 14% were neutral they were gaining the same value from a teaching certificate program by delivering a hybrid lecture in comparison to an in-person lecture. Conclusions: Preliminary survey results suggest that while the changes in educational content delivery did not impact the residents’ confidence and perception of ability to prepare and deliver educational content both in-person and virtually or the perceived value of the teaching certificate program, the majority of the participants were neutral that they could make the same impact on a student regardless of delivery method.

Pharmacy Student Stress with Transition to Online Education during the COVID-19 Pandemic

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Objective: Pharmacy student-perceived stress may impact their academic experiences. This research aimed to investigate whether there was an increase in student-perceived stress during the COVID-19 pandemic. Methods: Current pharmacy students were surveyed in May 2020 at a public pharmacy school that utilizes an active learning design and follows a flipped-classroom approach. In addition to measuring perceived stress, the survey measured coping behaviors, self-efficacy, and emotional status. The collected data were compared with archived data that were collected for internal use using the same survey instrument in 2018. Student's t-test analyses were used to compare 2020 with 2018 data using SPSS version 24. Results: Following an IRB approval from the office of research integrity at the same academic institution, a total of 66 students completed the survey (response rate = 26.2%) compared with 192 students who completed the survey in 2018 (response rate = 63.2%). On a scale from 0 (Never or not applicable) to 5 (Multiple times each day), the average student-perceived stress was 1.75 (SD=0.93) in 2020. This value of perceived-stress presented a slight, but not statistically significant, reduction from 1.85 (SD=1.04) that was recorded in 2018. Finally, comparing 2018 and 2020 datasets showed no significant differences in coping behavior, self-efficacy, or emotional status. Conclusions: The findings suggest that student-perceived stress did not increase during online, remote learning associated with the COVID-19 pandemic. Perhaps the COVID-19-related changes were seamless to students due to their aptitude for remote, online learning.

Piloting a College-Wide Assessment Process

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Objective: Establishing an overall assessment process (OAP) allowing stakeholders to access data in “real time” can lead to more effective data-driven decision-making. Recent scholarly work in medical and pharmacy education supports holistic, continuous quality improvement approaches through collaborative assessment practices and attempts to examine broader issues throughout the college/school. (Evans et al., 2019; Shroeyer et al., 2016; and Timpe et al., 2012). Methods: The University of Texas at Austin College of Pharmacy (UTCOP) piloted its own OAP in 2019-2020, engaging multiple committees to review various sources of 2019 data and provide input. The pilot launched an ongoing process with faculty, staff, PharmD and graduate students, preceptors and alumni through participation on 10 standing UTCOP committees/subcommittees invested in the UTCOP results of the 2019 AACP Curriculum Quality Surveys. Each committee was
Results: Seven of ten committees participated in providing feedback for broader review by the PharmD Student Assessment Council (SAC) and UTCOP leadership in the Pharmacy Assessment Council (PAC). Additionally, two of three committee chairs provided comments and suggestions for future OAP iterations. In year two, 2020-2021, a revised OAP was expanded to include review of 2020 program surveys from both AACP and UTCOP by eight standing committees with plans for broader discussions with the SAC and PAC by this summer. Conclusions: The OAP continues to be refined, with additional resources being developed to continue to guide the committees, and updates provided to the UTCOP community at least annually. A routine system could encourage better documentation of activities and promote a greater culture of assessment, leading to positive changes for all stakeholders.

Practice Ready? Pilot Implementation of the Entrustable Professional Activities throughout the Curriculum
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Objective: The Entrustable Professional Activities (EPAs) were created as an approach for assessing student competency attainment. While voluntary, programs can integrate and use this information to demonstrate whether their students are practice-ready and team-ready for accreditation. Thus, the objective was to (1) describe the implementation and (2) assess student perceptions of and actual EPA domain competence. Methods: The EPAs were integrated with the students entering the program during the 2018-2019 academic year and progressively expanded. Activities were mapped to the EPAs; OSCEs were added at the conclusion of each pre-APPE semester. Experiential teams across the entire state collaborated on an APPE rubric mapped to the EPAs. A Likert-type, self-assessment (self-perceptions of EPA domain competence) was administered at baseline (beginning of P1 year) and at the end of each academic year. Calibration and leveling of the rubrics and data as recommended in the literature was performed with the EPA pilot-testing. Data from 3 years were collected and analyzed descriptively. Results: Student self-perceptions of their EPA performance was rated higher than actual performance (eg. students rating themselves as a 2 or greater when expectations were a 1 or 2). In the P1, P2, and P3 years, the cohorts met or exceeded performance expectations. Preceptors also rated P4 student competency to meet the minimum standards. Conclusions: The competency results demonstrate that students are achieving performance levels, and this project provides perspective on an approach to EPA implementation. However, work still needs to be done to assist students in their metacognition. Continued evaluation of the calibration efforts as well as focused training of preceptors and faculty after completing a self-assessment are next steps in this project.

Psychosocial Factors Affecting Genetic Testing Decisions in Cancer: An Interview Study
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Objective: To determine how psychosocial factors influence the US general public’s cancer genetic testing decisions. Methods: A contracted market research company, Moore Research, recruited interview participants from a national database of those who had opted-in for market research, with additional social media postings. Participants were members of the general public and were asked to provide their opinion on what factors may affect their decision to receive genetic testing to help guide treatment choices if they were to be diagnosed with cancer in the future, or if they had already experienced this. The 30-minute, semi-structured telephone interviews were performed by four trained interviewers from Moore Research, and interview participants received a $30 gift-card. Verbatim field notes were taken during interviews and coded in Excel using a deductive coding approach guided by the Theory of Planned Behavior and Theory of Human Caring. A random 10% of field notes were double-coded to evaluate inter-coder reliability (percent agreement=89.72%). Results: Eighty interviews were completed. Eleven percent of participants had ever received a cancer diagnosis. Intention to undergo genetic testing in cancer treatment was influenced by subjective norms, with most participants (95%) stating their doctor’s opinion would influence their decision, and 76% stating the opinions of their immediate family would influence their decision. Further, 70% agreed cost was a decision factor. Participants wanted statistics about effectiveness, side effects, risks, and survival rate differences between people with and without genetic testing, and to know how, where, and by whom the test would be performed. Conclusions: When clinicians communicate with patients about receiving a genetic test for cancer treatment, both psychosocial factors like doctors’ and family members’ opinions and test-specific clinical and logistic factors should be considered.
Shennong 神農 - The Father of Traditional Chinese Medicine

David M. Baker, Western New England University, Kitt Lee, Western New England University.

**Objective**: From a pharmaco-historical standpoint, traditional Chinese medicine is one of the longest-lasting medical practices still in use today. The intent was to compile its origins from Chinese sources, separate the legend from the fact, arrange it chronologically, and re-narrate the history.

**Methods**: With the assistance of University-attending Chinese pharmacist-scholars, a selection of Chinese publications concerning Shennong were collected. Based on Shennong’s development of herbal medicines, several were selected, translated, and reviewed. From these a timeline of the legend and history of Shennong was developed.

**Results**: Shennong, or Shen Nung, is one of the most well-known ancient Chinese Emperors. He lived during a period called the Era of Legends (before 1700B.C.) when Chinese sources, since written language did not exist. Known for many contributions, such as controlling fire, improving agriculture, inventing musical instruments, and creating pottery, his discoveries in medicinal herbs commenced the discipline of traditional Chinese medicine. Despite thousands of years passing, his teachings still have influence on modern-day Chinese medical practice. Over the millennia, his story became more myth than truth, with many viewing him as a deity. Hence his designations as the God of Agriculture and Emperor of the Flame. His herbal knowledge was extensive, and passed by word-of-mouth, became the foundation of traditional Chinese medicine. This knowledge became the basis of the first written Chinese medical literature, Shennong Materia Medica. Encompassing 365 medicinal herbs’ medical properties, it was named for him during the Han dynasty (202B.C. - 200A.D.).

**Conclusions**: Despite living millennia ago, Shennong’s contributions to traditional Chinese medicine remain influential to the 1.4 billion-plus people in China today. The legend remains, too, as Shennong is still worshipped in Shanxi, China.

Societal Responsibility Themes in the Vision and Mission Statements of US Pharmacy Programs

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**Objective**: The authors aimed to assess the prevalence of societal responsibility themes in pharmacy programs’ vision and mission statements. **Methods**: The authors collected the vision and mission statements of 142 pharmacy programs by visiting each program’s website. The statements were compiled and uploaded in NVivo 12, a qualitative data analysis software for textual analysis. A word cloud analysis of the vision and mission statements was conducted to count the citation frequency of a set of pre-defined codes. Deductive qualitative analysis was used to code and categorize the themes. The Topic Extraction method with principal-component factor analysis was utilized to identify latent thematic dimensions or factors across the mission statements. **Results**: Education, research, and professional practice emerged as prominent themes. The prevalence of research, professional practice, and leadership themes was significantly higher in public programs’ vision statements than private programs. In the mission statements, citation of research theme was significantly higher in public than private programs. The citations of serving the diverse population and underserved population were very limited in the vision (6% and 5%) and mission statements (11% and 5%). Topic analysis conformed to the identified prominent themes and lack of societal service theme in the mission statements. **Conclusions**: The prominent themes that emerged in the vision and mission statements included education, research, and professional service. There is a distinctive lack of citations of societal responsibility towards underserved populations in the pharmacy programs’ vision and mission statements. The findings may serve as a call for U.S. pharmacy schools and colleges to be more conscientious and proactive in updating their mission statements and incorporating the language of societal responsibility.

Specialty Pharmacy Innovative Workshop: Principles of Workflow Management, Medication Access, and Telehealth

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**Objective**: Implement and evaluate a specialty pharmacy workshop (workflow management, medication access, and telehealth) across pharmacy management and skills lab courses. **Methods**: Two pharmacy educators and four specialty pharmacists designed and delivered a specialty pharmacy workshop in the third-year curriculum. The workshop included a 90-minute lecture/discussion in the pharmacy management course (workflow management), 30-minute pre-lab video assignment (medication access), and 2-hour clinical skills laboratory activity working through a four-part case and discussing virtually (telehealth) with specialty pharmacists. A pre-post survey was utilized.
as the primary outcome to assess knowledge (10-item), attitude (11-item), and perceptions (9-item). Results: Of the 123 students enrolled in the course, 88 students (71.5%) completed both pre-post surveys. On a 10-point scale, knowledge improved from 6.0 ± 1.7 to 7.3 ± 2.0 (p < .05). Score improvements were observed across 6 out of 11 items on attitude. These were related to feeling comfortable providing education about specialty pharmacy, interest in seeking rotation and post-graduate training opportunities in specialty pharmacy. Attitudes of seeking career opportunities in specialty pharmacy did not reach significance. All 9-ites showed increase in perceived confidence to perform specialty pharmacy tasks in areas of performing pre-verification, post-verification, product processing/delivery tasks, provider/patient education, prior authorization, REMS program, billing, and accreditation. Conclusions: The specialty pharmacy workshop was used as a method to familiarize students with the specialty pharmacy workflow management, medication access, and telehealth. Students perceived the workshop to be a relevant and meaningful learning experience that allowed them to feel confident in developing knowledge and understanding of the specialty pharmacy topics. The workshop can be replicated at a larger scale with schools of pharmacy utilizing the integration between didactic and laboratory courses.

Student Assessment Council: Engaging Students in PharmD Curriculum Decision Making

Rochelle M. Roberts, The University of Texas at Austin, Catherine Schlichting, The University of Texas at Austin, A. Nikki Hempe, The University of Texas at Austin.

Objective: The Student Assessment Council (SAC) was developed at the University of Texas at Austin College of Pharmacy (UTCOP) in 2018. The goal of the SAC is to promote continuous improvement of the PharmD curriculum and implementation. Methods: The SAC utilizes semi-structured focus groups for each graduating class, consisting of 8-10 students who have applied to participate. All students in the college are given the opportunity to provide feedback through a survey at the end of each semester. Results: Fall 2020 survey results were shared with each course instructor to offer an opportunity to provide their feedback. The quantitative results from the survey along with the faculty feedback were then provided to the SAC focus groups for further review and discussion. Following the SAC meetings, the cumulative results were shared with pertinent college leadership and committees for further action on common themes identified. Conclusions: This continuous feedback cycle allowed for more open communication among stakeholders to identify issues in the PharmD curriculum and make adjustments to future courses. Similarly, Moseley, Ford and Wilkins (2020) used focus group data to understand how PharmD curriculum and experiences support student pharmacists’ development from “Learn Teams” that facilitated continuous, real time student feedback on their curriculum for programmatic improvement. The UTCOP intends to continue to elevate student engagement in programmatic decision making through various feedback opportunities, with the goal to empower students throughout the college to contribute to the continuous improvement of the PharmD program.

Student Attitudes Towards Evidence-Based Practice Before and After a Literature Evaluation Course Series

Joanne LaFleur, The University of Utah, Lauren Heath, The University of Utah.

Objective: Future pharmacists must read, interpret, and critique the medical literature, soundly interpreting the evidence. A 6-credit, 2-semester course series is dedicated to teaching 2nd-year professional students to critique a broad array of drug study types. We assessed student attitudes and knowledge about evidence-based practice (EBP) at baseline and after the series. Methods: Students completed the attitudes and skills subscales of the EBP-Knowledge, Attitudes, and Behaviors Questionnaire (KABQ), a validated instrument for assessing clinician disposition to the use of published literature for clinical decision-making. The assignment was part of quality-improvement efforts. Institutional review board (IRB) approval was also obtained, and students were invited to consent to being included in the analysis. Results: Out of 61 enrolled students, 56 (91.8%) consented. A majority were female (67.9%), and most were ages 20-30 years (89.3%). Most had previously earned at least a bachelor’s degree (71.4%). 39.3%, 17.9%, and 14.3% of students reported having previously received <5, 5-10, and 10-15 hours of EBP training, respectively. Mean (standard deviation [SD]) scores for the attitude subset of the EBP-KABQ were 62.8 (6.8) at baseline and 65.4 (6.3) at the end of the series, an increase of 2.6 points (95% confidence interval [CI] 1.0, 4.3, p < .01). Most scored above the threshold for a “positive” attitude (52) at both timepoints including 94.6% before and 98.2% after the series, p = .054. Mean (SD) scores for the knowledge subscale also improved from 44.2 (3.2) to 45.6 (3.3), an increase of 1.2 (95% CI 0.2, 2.1, p < .05). Conclusions: Second-year professional students self-reported positive attitudes and skills assessments, both before and after the literature evaluation series. The course series was associated with small improvements in measures on both scales.
Student Perceptions of a Medical Spanish I Elective Course: Pre/Post Course and 1 Year Later
Carrie L. Griffiths, Wingate University, Geoffrey Mospan, Wingate University.

Objective: Spanish is the second most used language in the United States. Pharmacists need to be able to communicate with these patients about their medications. Current literature shows that there are not enough Spanish-speaking pharmacists or technicians to adequately serve this population. The objective of this study is to gain understanding of student perceptions of their Spanish ability and comfort level before and after taking a Medical Spanish I elective course and then 1 year later. Methods: A pre- and post-course survey was given to each student enrolled in the Medical Spanish I elective course and then a follow-up survey at the end of their P4 APPE year. Descriptive statistics were used to describe the data. This study was approved by the institutional IRB. Results: A total of 87 students were enrolled in the course over 3 years. The response rate for the P3 pre-survey was 95.4% (83/87) and 91.9% (80/87) for the post-survey. When comparing pre- and post-survey results, student responses showed an increase in comfort level when performing activities in Spanish. Student perceptions were similar both pre- and post-course survey. P4 survey results showed that 49% of respondents (25/51) used Spanish while on their APPE rotation, with the majority of interaction occurring in the Community setting (29%, 15/51). Conclusions: Overall, there is value to the Medical Spanish Elective course in both the short and long term. The students felt more comfortable to be able to perform patient-related activities in Spanish upon completion of the elective course. Instructors of Medical Spanish courses should be encouraged by the results of this study and the continued use of Spanish by pharmacy students beyond the course.

Student Pharmacists’ Attitude Changes toward an Online Introductory Interprofessional Course: A Mixed Method Study
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Objective: Interprofessional education (IPE) is crucial for health professional students including student pharmacists because it develops competencies to enable them to effectively work with other health professionals in healthcare teams. Online IPE experiences may be considered as introductory IPE which can enhance students’ awareness of IPE fundamentals and prepare them for future professional practice. The purpose of this research was to (1) measure changes in student pharmacists’ attitudes toward an online introductory interprofessional course, and (2) merge quantitative and qualitative results to obtain a comprehensive understanding of attitude changes in this introductory course. Methods: A convergent mixed methods design was used and involved quantitative data about the attitudes measured by the SPICE-R2 survey (Roles, Team, and Outcomes subdomains) and qualitative open-ended questions about students’ opinions. Participants completed the SPICE-R2 survey two times, before and after completing an online course. A paired t-test analysis was used. Results: Of the 89 first year student pharmacists that participated in this study, 58 students provided consent, and complete data from 55 students were used. Paired t-tests showed significant improvements in student pharmacists’ attitudes after completing the online course for all subdomains (p<.001) and the qualitative data confirmed and expanded this. An increase of SPICE-R2 scores for Roles subdomain was confirmed by two qualitative themes, “Self-role explanation” and “Others’ roles.” For Outcomes subdomain (ie, patient-focused care), a theme of “Healthcare challenges” expanded its SPICE-R2 scores. Students also provided insightful recommendations for the online course. Conclusions: The online course was an effective learning activity for improving student pharmacists’ attitudes toward IPE. The mixed method findings provide critical findings to more fully understand attitude change.

Team Based Learning and its Contribution to Communication Skill Development in Student Pharmacists
Robert C. Haight, University of North Texas Health Science Center, Marta J. Brooks, Regis University.

Objective: Team Based Learning (TBL) has been widely adopted throughout academic pharmacy. The adoption of this learning strategy is partially related to the importance of training student pharmacists to be part of interprofessional teams. Research has been conducted indicating that TBL is an efficacious learning strategy in academic pharmacy whereas little has been studied to determine what affective skills are being developed through TBL. The researchers engaged in an initial qualitative study to identify the leadership skills and associated affective skills that are developed in TBL settings. The top theme to emerge from this study was communication. Methods: The study examined the perceptions that student pharmacists and preceptors had on TBL developing affective skills. A qualitative analysis was conducted utilizing a grounded theory approach to analyze preceptor interviews and student focus groups (P1-P4). The researchers utilized an a priori codebook to analyze the interviews and focus groups to determine participant
perceptions on TBL affective domain skill development. **Results:** Nine preceptors were interviewed and 23 student pharmacists participated in focus groups. Participants in the study identified the importance of leadership skills to being a pharmacist. Participants identified affective skills important to being a leader and communication was identified most frequently and rated as one of the most important skills. Participants also indicated that they believed that TBL was a large contributor to the development of communication skills among student pharmacists. **Conclusions:** This initial study indicates that student pharmacists gain skills related to communication through TBL engagement and additional research is needed to further explore and develop an instrument to measure the role of TBL in affective skill development, in the context of being a leader in the pharmacy profession.

The Impact of an Online Educational Intervention to Improve Attitudes on Medication Safety in Pregnancy

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**Objective:** To evaluate the impact of a web-based video educational intervention on improving attitudes on medication safety during pregnancy and lactation. **Methods:** A quasi-experimental study among women of reproductive age (18-44 years) recruited through an online survey vendor was conducted. Women who had difficulty understanding English and those who did not provide consent were excluded from the study. **Results:** A total of 210 women were included in the study, of who 29.5% were currently pregnant, 29.0% had a child <1 year old, and 2.9% were currently pregnant with another child <1 year old. The women were predominantly married (61.4%), White (69.5%), and had at least a high-school education (60.0%). After the intervention, more women had attitudes aligned with medication safety. Specifically, more women agreed that medication use during pregnancy saves the lives of unborn children, and that treating illness while pregnant benefited the fetus (p<.05) post-intervention. Similarly, after the intervention, fewer women believed that all medicines would harm the fetus; that they had a higher threshold for medicine use when pregnant; that doctors prescribe too much medication to pregnant women, and that natural remedies can generally be used by pregnant women (p<.05). **Conclusions:** This study shows a reduction of potentially harmful beliefs regarding medication use during pregnancy and lactation as a result of an online video-based medication safety intervention. Additional studies can further investigate the web intervention’s applicability and use in broader and more diverse groups of patients of reproductive age.

Thomas W. Patrick, R.Ph., M.D. (1872-1953), and History of the Patrick School of Pharmacy (1892-1947)

David M. Baker, Western New England University, Ryann K. Collette, Western New England University, Scott A. Muley, Baystate Medical Center.

**Objective:** A historical interviewing project revealed the existence of an early 1900s pharmacy school, started and administered by a Black pharmacist in a predominantly white Irish neighborhood. Founded in 1892 by a Haitian immigrant, the Patrick School of Pharmacy prepared pharmacy apprentices to pass board examinations. The study objective was to learn the history of this phenomenal pharmacist-physician and his school. **Methods:** The research methods included Internet searches, ancestral record inquiries, descendant correspondence, public library/archive research, and historical site visits. **Results:** Thomas Patrick, born in Haiti in 1872, apprenticed as a pharmacist in Trinidad from age fourteen to twenty. In 1892, he moved to Boston, becoming a registered pharmacist within three months. That same year, he worked for E.L. Patch Company, Pharmaceutical Chemists; started tutoring apprentices; and began attending the College of Physicians and Surgeons, earning his M.D. in 1894. He founded a school where pharmacy apprentices, most lacking formal education, attended a six-month to two-year program to pass the pharmacy board examination. By 1897, he was a citizen with a great drive for success, refusing to let existing racial attitudes obstruct his goals. By 1910, his school averaged 150 students annually. After 55 years of teaching, of the thousands he taught, only 15 were Black by his count. **Conclusions:** Considering only 2% of Boston’s population was Black at the time, it did not factor into the School’s success or Dr. Patrick’s personal accomplishments. His passion for the profession and his students prevailed over the prejudices of his time. He educated nearly 5,000, who besides becoming licensed pharmacists, some also became mayors, judges, representatives, professors, and pharmacy board members - three on the Massachusetts Board of Pharmacy.

Use of a Horizon Analysis to Encourage Reflection in Introduction to Patient-Centered Communication

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Medical Sciences, Amy Franks, University of Arkansas for Medical Sciences.

Objective: In a virtual learning environment, it may be difficult for students to express doubts about new concepts. We describe the use of a modified horizon analysis (HA) as a reflection method to facilitate deep learning during a patient-centered communication course by 1) situating new information into existing experience, 2) recognizing and reflecting on resistance to new concepts, and 3) providing feedback for the instructor to address during synchronous class time. The HA was modified from a syllabus of Michael McCarthy, PhD, Religion and Bioethics, Loyola University Chicago, 2020. Methods: Course content delivery was via online modules for motivational interviewing (ComMiI). Each student (N=84) submitted an HA for one module, answering the questions: 1) Which concept(s) were already familiar? 2) Describe an experience that demonstrates this, 3) Which concept(s) did you find yourself resistant to? and 4) Why?. HAs informed the content of subsequent synchronous class sessions so that areas of resistance could be discussed further. Students were surveyed regarding their perceived usefulness of the HA. Areas of resistance were categorized by topic. Results: Survey results (N=83, 98.8% response rate) demonstrated that students found the HA useful for relating content to experience (79.5%), recognizing resistance to concepts (81.9%), and reflecting on reasons for resistance (77.1%). They found class discussions related to the HA useful (85.5%). The 84 student reflections revealed 4 areas of resistance: spirit of motivational interviewing (N=39 students), reflecting core concerns (N=23 students), addressing core concerns (N=16 students), and time required (N=6 students). Conclusions: The HA is an effective reflection method, is helpful for collecting areas of resistance to patient-centered communication concepts for the instructor to address during synchronous class time, and was well-received by students.

Yoga Works! Community Based Participatory Research Improves Student Pharmacist Mental Health

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Objective: In a Lifestyle Medicine Elective, student pharmacists facilitated and participated in yoga and mindfulness, non-pharmacological lifestyle modification techniques, to improve the mental health of 3rd and 5th grade youth participants. Yoga has been shown to positively impact medical conditions, psychiatric conditions, and phase of life problems. When student pharmacists’ coping skills surpass their stress levels, they report feelings of depression, anxiety and engaging in compromising risk behaviors. We investigated whether the facilitation and participation of yoga-like exercises and mindfulness activities in a lifestyle medicine elective decreased negative mental health aspects in student pharmacists. Methods: Sixty-three student pharmacists participated in this study. Thirty-six students took part in an Immersive Lifestyle Medicine Elective (yoga intervention group) participated twice a week, 8-week yoga and mindfulness curriculum (Pure Edge Pure Power) to improve the health and wellness of 3rd and 5th grade students. Our comparison group included 27 student pharmacists in a Toxicology Elective. All participants completed the Beck Anxiety Inventory (BAI) and the Patient Stress Questionnaire (PSQ) before and after the course. Results: While BAI scores decreased for the overall sample from pre to post test, post test scores for the yoga intervention group were significantly lower on the anxiety (p<.05), depression (p<.05), and PTSD (p<.05) subscales within the PSQ compared to the control group’s scores. The groups did not differ on the alcohol use subscale. Conclusions: Participation mitigated student pharmacists’ feelings of depression and anxiety. Yoga may serve as a coping strategy; therefore, future research will focus on the impact of yoga on academic outcomes.

Zooming In: Students’ Perceptions of Telehealth Services Before and After Educational Training and Community Service

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Objective: Since 2007, our School has conducted 154 in-person health fairs targeting Medicare beneficiaries. However, in 2020, the COVID-19 pandemic required a first-time pivot to virtual fairs in which telehealth technology enabled provision of healthcare services. This study evaluated students’ perceptions before/after in-class telehealth training and participation in virtual health fairs. Methods: In total, 189 students (50 ‘Medicare’ and 139 ‘Non-Medicare’) completed a survey that was administered at three time points (baseline, [T1]), end of training (T2), and after all virtual health fairs (T3). Only Medicare students received formal education/training on the provision of telehealth services and had an extensive experiential requirement. Survey questions were based on demographics, Theory of Planned Behavior ([TPB] attitude, social norm, self-efficacy) and
the Technology Acceptance Model ([TAM]; usefulness, ease of use). Two-factor mixed-model ANOVA was conducted with Group (Medicare vs. Non-Medicare) and Time (T1, T2, T3) as factors evaluating differences in TPB and TAM constructs. Multiple linear regression analysis evaluated whether TPB/TAM constructs predicted students’ intentions to use telehealth in their future professional practice. **Results:** The mixed-model ANOVA revealed significant effects of Group and Time on TPB constructs. TAM construct scores significantly differed on time alone. Post-hoc analysis demonstrated that TPB construct scores were significantly higher in Medicare students. Scores on TPB and TAM constructs showed significant improvements after students’ training and again after the virtual health fairs. Regression analysis revealed that TPB (attitude, social norm) scores predicted the intention of Medicare students, whereas TAM (usefulness) scores predicted the intention of Non-Medicare students to use telehealth in their future practice. **Conclusions:** Telehealth-related training and real-world experience improved pharmacy students’ attitudes, social norms and self-efficacy beliefs. Educators should seek ways to implement such training/experience.