FIP VIRTUAL 2020

Pharmaceutical Practice: Academic Pharmacy

A case-based approach to teach pharmacogenetics as part of pharmacology course in undergraduate curriculum

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Background: Pharmacogenetics (PGx) testing is a rapidly evolving subject in precision medicine, regarding scientific development, translation into clinical practice and expected benefits in patient outcomes. The main purpose is to analyse how the genetic makeup of patients will uniquely affect their response to medication (Haga & Moaddeb, 2014). Pharmacists are a key stakeholder in the delivery of PGx testing. Thus, the need to put more educational effort into this field is necessary and recommended by professional organisations (Jenkins *et al*., 2001; ACPE, 2016), yet underrated in pharmacy curricula (Giri *et al*., 2018; Ta, Cayabyab & Coloso, 2019).

Purpose: To develop and evaluate a pilot case-based learning (CBL) course, on the advancements in PGx and their impact on patient-oriented decisions as part of the Pharmacology Course in the undergraduate Pharmacy curriculum.

Method: Previous relevant publications were retrieved from databases and reviewed in order to design a robust teaching and evaluation method.

Results: Currently, PGx is commonly taught by conventional lecture-based methods. We cannot completely substitute them with CBL; but it can supplement and reinforce the subjects (Hagga & Muaddeb, 2019), as students work in small groups, actively building their knowledge. Students' perceptions of the importance of PGx in clinical decision-making, the appropriateness of CBL approach in the context, and their satisfaction with the course should be assessed by qualitative surveys.

Conclusion: The course will be developed based on situations where PGx testing affect decision making about patients' drug therapy. Well-designed investigations are needed to assess the feasibility, appropriateness and educational value of using a CBL approach to bring such situations in PGx testing to the Pharmacology Course.

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Longer term reflections and outcomes of pharmacy and medicine participants following undergraduate IPE

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Background: Many studies have reported satisfaction with and learning from undergraduate inter-professional education (IPE) IPE. However, there is a lack of research reporting any longer-term effects of IPE.

Purpose: The study aimed to explore the application of the learning of third/fourth year undergraduate pharmacy and medical students 12-24 months after case-based prescribing/ therapeutics IPE.

Method: Following ethics approval participants were interviewed face-to-face, by telephone or Skype. Verbatim transcripts were thematically analysed inductively, and deductively using Kirkpatrick's (K) training evaluation model (Praslova, 2010).

Results: Nineteen (19) medicine and 14 pharmacy interviews were conducted. Six themes were identified inductively: 1-preparedness; 2-students as learners & teachers; 3-knowledge/ skills development; 4-application of learning, 5-session value; 6-suggestions for change. Participants recalled the session as enjoyable and interesting (K level 1-reaction), attitude modification (level 2a), skills/knowledge acquisition (level 2b) and some examples of behavioural change (level 3).

Conclusion: Participants reported learning with, about and often from each other. Examples of K level 3 outcomes were from those in employment. No organisational change (level 4) or improved patient outcomes (level 5) were reported, which was not unexpected. Potential limitations include recall bias and it is possible that experiences post-IPE may have influenced recall. Additional IPE has now been embedded and so it would now useful to evaluate the IPE curriculum as a whole.

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Closing the gap on global competencies for pharmacy education using ASHP and EAHP statements

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Background: FIP Workforce Development Goals (WDGs) are focused on multiple facets of the profession, including education, while American Society Health-System Pharmacists (ASHP) and European Statements on Hospital Pharmacy (EAHP) statements are focused on clinical practice. Mapping the relationship is valuable as workforce development and practice are inextricably linked.

Purpose: To identify similarities and differences between the FIP WDGs, ASHP and EAHP statements.

Method: Five educators conducted the research project, four of whom are global leads for FIP WDGs. Reviewers compared ASHP statements and EAHP statements, all to FIP WDGs. A final reviewer evaluated the maps for appropriateness and external validity. Using a likert scale of 0-3 (0 =no match, 1=application to context only; 2=partial match, 3=complete match), the reviewers assessed competency similarities.

Results: There are 13 WDGs, 38 ASHP statements, and 44 EAHP statements. Of 38 ASHP statements, there were only 3.6% matches ranking '3', 22.8% matches ranking '2', and 73.5% that did not match, but reflected the intent of the WDGs (ranking '1). Of 44 EAHP statements, there were 34.1 % matches ranking '3', 38.6% matches ranking '2', and 81.8 % ranking '1'. More than one WDG was allowed to be mapped to each ASHP and EAHP statement.

Conclusion: These maps provide insight into how current pharmacy WDGs may impact broader practice goals for the workforce. Given the majority of ASHP statements and only one third of EAHP statements mapped to FIP WDGs, future work can focus on unifying the direction between workforce development and practice, and elevating the role of educating student pharmacists as part of a workforce development effort.

Creating global health leaders in pharmacy by evolving postgraduate training

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Background: There has been a push for increasing global health education and training opportunities within pharmacy (Cudmore, 2005; Merson, & Page, 2009; Hanson, Harms, & Plamondon, 2010; Pinto *et al.*, 2014). Global health postgraduate learning opportunities are necessary to define pharmacy career paths and develop leadership in global health. There are many challenges to starting a global health postgraduate training programme.

Purpose: The purpose is to propose methods to increase opportunities for global health career and leadership development in pharmacy.

Method: A literature review and internet search were completed to identify existing postgraduate global health training opportunities in pharmacy. Evidence-based methods to modify existing postgraduate training opportunities to include global health topics and leadership development were proposed.

Results: Some postgraduate global health training opportunities do exist in pharmacy (Thompson, 2008; Miller *et al.*, 2016; American College of Clinical Pharmacy, 2020; Commonwealth Pharmacists Association, 2020). Few programmes are explicitly marketed as global health. Different strategies can be used to incorporate global health into existing postgraduate training opportunities. Possible solutions include relating local health to global health, expanding upon existing partnerships to provide international global health experiences, use of technology and simulation for virtual global health interaction, and emphasis of implementation science principles to connect and translate local health interventions to a global scale.

Conclusion: Postgraduate training programmes can incorporate global health topics to promote global health career development and leadership opportunities in pharmacy.

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Interactive interview preparation topic discussions: Preparing students to discuss global health experiences

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Background: In 2003, the Purdue University College of Pharmacy established an eight-week global health Advanced Pharmacy Practice Experience (APPE) in Eldoret, Kenya. Students have reported difficulty summarising their experiences when questioned during interviews, often failing to connect the experience to skills needed in United States-based careers.

Purpose: The purpose of this project was to assess the impact of interview preparation topic discussions designed to train student pharmacists to effectively reflect and articulate on clinical, inter-professional, communication and cultural skills gained in a global health APPE

Method: A 19-question survey was distributed via Qualtrics to 59 students who participated in the topic discussions over a three year period. Baseline demographics and postgraduate plans were collected. Additional questions were formulated using a 5-point Likert scale and addressed the effectiveness of the discussions and application in interviews.

Results: Of the 59 students who received the survey, 42 students provided complete responses. Thirty-two (32) students 'strongly agreed' that they were able to apply their experiences

in Kenya to typical interview questions. twenty-nine (29) students either 'strongly agreed' or 'agreed' that the discussions helped them to be overall more successful with interviews. Thirty Five (35) students 'strongly agreed' or 'agreed' that the topic discussion should be continued for future students.

Conclusion: Students who participated in the topic discussions demonstrated confidence and an ability to articulate their global health experiences when asked about their APPE in an interview. In general, students agreed the discussions should be continued in future years.

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Designing a work-integrated problem-based workshop: Collaboration of academia and industry

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Background: Transition from being a student to a pharmacist is challenging, as there might be a gap between the theory and practice. Work-integrated learning (WIL) can support students in this identity transition by enabling them to use their knowledge in a real-world setting (Noble, McKauge, & Clavarino, 2019). Problem-based learning (PBL) is a pedagogical approach which focuses on active student-centred learning through the experience of solving a meaningful problem (Wood, 2003).

Purpose: To combine PBL and WIL in order to develop a workshop for student pharmacists who aim to pursue a career in the pharmaceutical industry.

Method: We will ask our partners in the industry to help us design problem cases from actual issues they face in work setting, including Regulatory, Marketing, Quality Control, etc., with respect to the confidentiality. These cases will be brought to a collaborative workshop. The workshop needs to be evaluated using a robust method such as Kirkpatrick's framework (Tamkin, Yarnall, & Kerrin, 2002).

Results: During the workshop, cases will be randomly assigned to small groups of student volunteers. Each group has to work on their case and this process involves teamwork, self-directed learning, cooperation and finally presentation skills. According to Kirkpatrick's framework, evaluation of reaction can be conducted by course-rating features at the end. Learning level can be assessed by performing pre- and post-tests in the first and last day, assessing participants' knowledge (Tamkin, Yarnall, & Kerrin, 2002).

Conclusion: A well-organised design to carry out all the processes as planned is feasible and will be conducted. Confidentiality, collaborative approach and assessment of the efficacy are the main features of this study.

Retrieving pharmacological knowledge through a modified version of mind palace technique

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Background: The *method of loci* (MOL) is probably the most versatile mnemonic tool (Bellezza, 1981) arranging and recalling the memorial content, based on the spatial relationship between 'mind palaces' (Dalgeish *et al.*, 2013). In an earlier study the use of MOL has been shown to lead to a better information recall in medical students (Qureshi *et al*., 2014).

Purpose: High efficacy of MOL to enhance memory introduces an evident potential to help pharmacy students recall drug-related concepts. Before designing such a device, its pros and cons should be evaluated.

Method: Relevant literature between the years 1990 and 2020 were identified by searching electronic databases such as PubMed and SCOPUS.

Results: MOL facilitates recall by creating associations between new items and already stored items in the long-term memory. The process of implementing MOL in teaching is time-consuming unless students have a common familiar place to use as the *loci*. It can be virtual (Legge *et al*., 2012). To assess the effectiveness of the method in the context, a pilot study should be designed. There's also a need to assess if it encourages students' interest and stimulates active learning.

Conclusion: To eliminate the required mental effort to create the *loci* and link them to the new items (in our case, drug-related concepts), which reduces students' compliance, virtual reality of a hospital will be used. It needs to have well-organized details with many eye catchers and drug-related concepts integrated/ dispersed by experts. A pilot study should be performed and evaluated using The Kirkpatrick Four-Level Training Evaluation Model (Smidt *et al*., 2009) to evaluate the designed programme and improve it accordingly. The authors will implement the modified version of the model according to the findings of this study.

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Education and training in veterinary pharmaceutical sciences

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Background: The responsibility to provide high-quality pharmaceutical care for animal patients challenges pharmacist knowledge regarding indications, dosages and drug administration in animals.

Purpose: To develop a training programme for pharmacists in veterinary pharmaceutical sciences.

Method: Three questionnaires were developed and disseminated to veterinary surgeons, pharmacists and pet owners to identify challenges of access to medicines and the perception and contribution of the pharmacist in the treatment of animals. Data collected were used to design a training programme for pharmacists. The training programme was validated using a modified e-Delphi method.

Results: Respondents consisted of 92 pharmacists, 21 veterinary surgeons and 231 pet owners. Seventeen (17) veterinary surgeons prescribed human medicines for use in animals because the veterinary medicinal product needed was not available. Pharmacists were perceived as unprepared to safely dispense and provide advice for medication use in animals by 61 pharmacists, 16 veterinary surgeons and 122 pet owners. Pharmacists (68) and veterinary surgeons (16) agreed that pharmacists should be trained in veterinary pharmaceutical sciences. Pet owners (n=171) would be more willing to ask a pharmacist for advice if they could be sure the pharmacist is knowledgeable. The validated training programme consisted of three main areas, namely veterinary disease states, veterinary pharmacotherapy and regulation of veterinary medicinal products.

Conclusion: The perception on the skills of pharmacist with regards to veterinary pharmaceutical care remains a challenge and a barrier to the optimisation of veterinary pharmacy services.

Podcasting as an asynchronous e-learning tool for pharmacists

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Background: As health professionals, pharmacists must maintain their knowledge and skills up to date. Currently, the most common way to provide education in our organisation is through attendance-based courses. A limitation of these courses is the requirement of attendance at established times. This situation calls for new approaches to make education more accessible. Podcasting is an asynchronous e-learning tool that allows access to educational material at anytime and any place.

Purpose: To assess the impact and the utility of podcasting as an asynchronous e-learning tool for pharmacists

Method: To design this project four steps were followed: analysis, design, develop, and evaluation. The analysis of the situation found that the number of pharmacists attending in-class courses was low. Our organisation decided to record a podcast on a monthly basis to be posted on our website so that registered pharmacists could click to listen or download each episode at any time. An analysis was performed by Google Analytics and the utility was assessed trough an on-line questionnaire.

Results: During the first year, 12 podcasts were posted. Analysis showed that the total number of downloads were 6,139 with an average of 453 per podcast (SD135). Downloads occurred mainly during the first month of release (78%, SD7.31). An on-line questionnaire was e-mailed to all registered pharmacists. It was completed by 123 (5.5%). Of the respondents, 95% agreed with the length, 96% considered the contents appropriate, 94% declared to apply these contents to their working routine and 96% would recommend the podcasts to others.

Conclusion: The number of downloads and the pharmacists feedback suggest that podcasting is a helpful e-learning tool.

SMART Innovation Workshop: Uncovering educational needs of Armenian pharmacists

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Background: Delivery of quality pharmaceutical care depends on pharmaceutical professionals (Rouse *et al.*, 2016). The shortage of competent pharmacists, and evolution of the profession require identification of priority areas for improvements to address locally determined needs (FIP, 2016; FIP 2017).

Purpose: The study reveals the viewpoint of key stakeholders concerning the main areas for change in education and practice.

Method: Brainstorming, SWOT analysis, and prioritisation. Learning, based on the Pillars and Foundations of Educational Quality incorporated in the SMART Pharmacist Programme (Meštrović & Rouse, 2015).

Results: As a result of interactive sessions (October, 2018), with the participation of 80 stakeholders, and facilitated by international experts (ACPE, Pharma Expert) the priority areas for change were identified by participants as:

1. Setting and implementation of monitoring and evaluation systems for professional practice.

2. Separation of the roles of pharmacists, clinical pharmacists and technicians; development of competency frameworks, and concordant changes in professional curricula.

3. Actualisation of the Continuing Professional Development (CPD) model of learning, and provision and availability of pharmaceutical information in the Armenian language.

4. Enhancing the capabilities of pharmacists to provide integrated care, with focus on non-communicable diseases and the introduction of new services.

5. Adaptation of curricula and professional recognition systems for all stages of careers.

Conclusion: Many Armenian priorities revealed map to challenges faced by the pharmacy profession internationally. Weak implementation of existing legislation underlines the main difference in the Armenian context.

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Specialisation and advanced practice in Armenia

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Background: The terms 'advanced practice' and 'specialisation' should reflect the stages of knowledge, skills, experience and performance (FIP, 2017). Evidence from other countries confirms that tools and frameworks for advancement are limited, often within the boundaries of curricula (FIP, 2015).

Purpose: To examine the perspectives of Armenian pharmacists for vertical advancement from initial education towards advanced practice and specialisation.

Method: Boundaries outlined by Armenian legislation for pharmacists and technicians were mapped with their educational pathway.

Results: 'Scope of Practices' mainly originate from foundation training. For example: technician - dispensing and compounding etc.; bachelor - also general practice, marketing, analysis etc.; additionally for masters - counselling, management; on top of that for pharmacist-specialists - research and supervision of 'pharmacists without masters degree'. 'Specialisation' refers to a narrow scope of practice for graduates of non-medical universities, for example: research for pharmacist-chemists. There are four specialisations for pharmaceutical residents graduated from medical universities. However, these lack competency frameworks, elements of vertical advancement or practices that extend beyond initial education. Professional development requirements (mandatory Continuing Professional Development) are not interrelated to real advancement and specialist development.

Conclusion: Defined requirements for a formal professional ladder exist only in academic pharmacy (associate professor, professor, corresponding member of academy, academician). In other sectors there is a lack of prerequisites for specialisation and professional advancement of pharmacists.

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Attitudes and perceptions for additional residency training: The value of postgraduate year three residency

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Background: While postgraduate year one (PGY-1) residencies offer entry-level exposure to pharmacy and PGY-2 provides an advanced specialty focus, PGY-3 residencies could fill in the gaps in key training areas. Presently there is a paucity of postgraduate year three pharmacy programmes, a question of its value in practice, and lack of standardisation for training.

Purpose: To determine the attitudes and perceptions of pharmacy residency members for PGY-3 residency training compared to other avenues of career advancement.

Method: A 28-item online questionnaire was emailed to all accredited residency programme members between January to March 2019. Questions were anonymous and assessed participant's perceptions for PGY-3 programmes regarding familiarity with concept, benefits and limitations, and programme structure.

Results: Eight hundred and forty-five (845) individuals participated in the survey with a 22.47% response rate. Only 288 pharmacists were familiar with PGY-3 training (34.4%). Benefits of PGY-3 training included job specialisation (34.41%), additional training (19.93%), and research skills (5.44%). Limitations of a PGY-3 included finances (21.62%), lack of justification (13.83%), and time commitments (12.94%). Board certifications (49.5%), scholarly activity (19.8%), and pharmacy organisational leadership (19.2%) were higher rated areas for career advancement over PGY-3 training. The majority of participants were opposed to the standardisation of PGY-3 programmes and had negative preconceptions of its implications on the job market.

Conclusion: Pharmacists were opposed to the concept of PGY-3 residency and noted limited benefits of the position professionally. Participants favoured on-the-job training and other areas for career advancement over PGY-3 residency.

A curriculum designed for disadvantaged, minority pharmacy graduates in medically underserved communities

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Background: Sixteen point two percent (16.2%) of pharmacy graduates are from underrepresented minorities (URM) or educationally, economically disadvantaged (DA) backgrounds. However, these students are more likely to practice in medically underserved communities (MUCs). As healthcare providers reflecting the nation's changing demographics, pharmacists from URM or DA backgrounds can be better equipped to tackle minority health issues, rural needs, and work in MUCs.

Purpose: To develop a pharmacy curriculum designed to increase the diversity of pharmacy graduates from DA and URM backgrounds that practice in MUCs.

Method: Didactic curriculum focused on MUC training through cultural awareness, diversity, and special health needs of unique populations. Strategic partnerships and collaborations were formed with healthcare entities and health departments in MUCs to allow exposure to diverse patients. Student support services included traditional components such as peer tutoring and faculty mentoring programmes, and novel stress management and family-oriented support services to ensure retention of DA and URM students.

Results: From 2016-2019, 75% of graduates were from DA backgrounds and 61% were URMs. Tracking of student retention with both academic and social support allowed for a 79% on-time graduation rate and 88% NAPLEX first-time pass rate. Over 57% of students had clinical rotations in MUCs, with 65% of those completing two or more rotations in MUCs. Out of 178 students, this approach led to 40% of graduates practicing in MUCs.

Conclusion: Creation of a didactic and experiential curriculum that focuses on recruiting, retaining, and graduating DA and URMs with enhanced exposure to MUCs allows for more students to continue serving in MUCs after graduation.

Critical moments for learning transformation on international pharmacy placements

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Background: International placements have been shown to be transformative for developing students personally and professionally in areas such as communication, empathy, self-efficacy, and cultural awareness. Mezirow's transformative learning theory suggests that students need to face a disorienting dilemma to prompt reflection of beliefs and construction of learning and perspectives.

Purpose: To evaluate self-perceived critical moments that were transformative to learning in students who participated in an international pharmacy placement.

Method: Final year students who went on an international placement participated in a one-hour focus group where they reflected on critical moments that were transformative for their learning. Focus groups were transcribed verbatim and went through a two-cycle, two coder open coding process using a conventional content analysis approach.

Results: Twenty-two (22) students across three schools of pharmacy opted to participate. Students went to high income (18%) and low-to-middle (LMIC) income (82%) country locations. Critical moment themes in the high-income group involved witnessing an innovative patient care technique and experiencing negative healthcare team dynamics. Themes in the LMIC group involved engaging in a sensitive patient interaction, experiencing healthcare system barriers, going out of their comfort zone, and making a difference.

Conclusion: International placements put students in unfamiliar environments that created disorienting experiences to transform students' personal and professional perspectives. A majority of critical moments evoked strong feelings that may have influenced self-reflection of values and beliefs.

Development of rural/underserved core curriculum for pharmacy students

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Background: East Tennessee State University, Bill Gatton College of Pharmacy is located in the south central Appalachian region of the United States, and has a mission to develop progressive, team-oriented pharmacists that improve healthcare, focusing on rural and underserved communities. Processes to formalise and better document the College's activities impacting rural and underserved communities began in 2017.

Purpose: To describe the early development and implementation of a core rural/underserved curriculum for Doctor of Pharmacy students within the overall curricular structure. Didactic, laboratory/simulation, and experiential components were designed with the goal of preparing all graduates for entry-level practice caring for rural and/or underserved patients.

Method: Descriptive analysis of strategic planning and implementation process that included administration, faculty, students, and external stakeholders using a Plan-Do-Study-Act implementation science approach.

Results: A Rural Health Initiative Strategic Plan was developed; competencies, learning experiences, and assessment plans have been implemented. All students participate in at least one high impact rural/underserved learning experience each year. Collectively over 800 rural/underserved experiential service learning hours were completed in the 2019-2020 academic year.

Conclusion: Core rural/underserved education is now in a quality assessment and improvement phase. Next steps in strategic implementation are to capitalise further on strategic partnerships, develop additional opportunities for specialisation, and expand upon related scholarship and assessment activities.

Use of World Café in a paediatrics and geriatrics course to address social health concerns

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Background: World Café was developed as a relaxed environment to engage participants in dialogue that would be strategic, transformational, and result in social innovation. Paediatric and geriatric pharmaceutical care is influenced by multiple social health concerns thus pharmacists must acknowledge these to provide holistic care. World Café provides a method of teaching that challenges students to actively engage in identifying these concerns and working towards solutions.

Purpose: World Café seeks to expand the perspective of pharmacy students beyond medication management to consideration of social, behavioural, and socioeconomic factors. Engaging in active dialogue and shared problem-solving encourages development of potential solutions to address contemporary issues in paediatric and geriatric populations.

Method: Faculty dedicated a three and a half hour class session each year to conduct a Paediatric and Geriatric World Café. Faculty provided a relaxed café environment and moved students through a series of questions as groups shuffle. Issues and related interventions are harvested from full class discussions at the end.

Results: For paediatric populations, students routinely identify immunisation concerns and advocate for community-pharmacy based interventions. For geriatric populations, students routinely identified fall risks and advocated for home assessment and educational interventions. Other issues varied based on current issues in the news and surrounding community.

Conclusion: The World Café requires significant planning, time, and space however it allows students a unique environment to engage in shared problem-solving related to contemporary issues impacting paediatric and geriatric patients.

Global health area of concentration in the Pharm.D. curriculum: Student perspectives

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Background: At the University of Pittsburgh School of Pharmacy, students can personalise their education by joining an area of concentration in global health (ARCO-GH). The ARCO-GH provides in-depth exposure to global health pharmacy practice through coursework, experiential placements, and research.

Purpose: To describe current students' global health interest, experiences in global health, as well as perceptions on cultural sensitivity and health disparities while participating in the ARCO-GH.

Method: This qualitative study recruited second to fourth year Doctor of Pharmacy (Pharm.D.) students currently enrolled in the ARCO-GH. Two focus groups were conducted with seven to nine participants in each session. The focus groups were audio-recorded, transcribed *verbatim*, and independently coded through an iterative process to determine major themes.

Results: A total of 16 students participated in two focus groups, including at least one participant from each academic year. Three major themes revealed that: 1) the ARCO-GH provided varied opportunities to personalise education, 2) students gained in-depth global health insight through hands-on experience, and 3) students developed new perspectives on approaching underserved care.

Conclusion: Students find value in the ability to their tailor interests in the area of global health. A concentrated experience in global health provides students the opportunity to grow professionally and understand the complex obstacles marginalised populations face locally and globally. This programme is a meaningful strategy to support Pharm.D. students in global health.

Development of a simulation centre escape room for third year Doctor of Pharmacy students

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Background: Gamification uses game mechanics to promote engagement and problem-solving. Over past years gamification has become widely used in both industry and academia as a tool for training and education.

Purpose: To describe the development and planning of a simulation centre escape room experience for Doctor of Pharmacy Students.

Method: Howard University College of Pharmacy (HUCOP) collaborated with the Howard University Health Sciences Simulation Centre to develop an escape room learning activity. Clinical cases were developed that focused on opioid withdrawal, diabetes, anxiety, and asthma. Each case requires students to apply didactic knowledge and demonstrate techniques like intramuscular injection, insulin dosing and injection, and appropriate inhaler use. Meetings with the simulation centre staff occurred in the autumn of 2019. All cases and lab parameters had to be provided to the simulation centre six weeks in advance and multiple meetings were required to ensure simulation centre staff understood the setup of the activity.

Results: Collaboration between HUCOP and the simulation centre allowed for true simulation of leisure escape room environments because the faculty can unobtrusively observe students in the room whilst also interacting with students from a distance. The simulation centre was equipped with an interactive health care mannequin and necessary equipment to simulate standard health care environments.

Conclusion: Increased utilisation of gamification allows for innovation in the delivery of activities for pharmacy learners. Collaboration with a simulation centre to conduct escape room activities for healthcare students is possible and provides a unique learning experience for student pharmacists.

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Inter-professional experiential learning in pharmacy education: A global scope review

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Background: For a change in healthcare services, a change in health training is necessary. Inter-professional education (IPE) and experiential learning (EL) have been pointed as crucial to provide patient-centred care through the building of effective collaborative health care teams.

Purpose: To analyse IPE experiences in pharmacy education described in recent literature.

Method: Scope review in six databases, including publications from the past five years on IPE experiences involving pharmacists or pharmacy students. Here are presented results

related to the teaching modality, learning scenario and methods of the experiences included in the review.

Results: One-hundred and forty-seven (147) articles were included. Experiences took place exclusively in person (124), exclusively e-learning (10) and blended (12). As for the scenarios, the experiences took place in the classroom (53), ambulatory/ hospital/clinic (33), in a mixed scenario (15), online (9), community (10) or specialised simulation centre (6). The most used methods were: education based on clinical practice (39), mixed methods (44), education based on simulation (32), education based on problems (21), seminar (11). 46 involved real patients.

Conclusion: Inter-professional experiential activities have been implemented using clinical and community workplaces, providing experiences with real and simulated patients. The articles indicate the methodological diversity of inter-professional education experiences being offered to pharmacists and pharmacy students in conjunction with other health and social service professionals.

Through the students' eyes: The perceived benefits of final year international pharmacy rotations

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Background: More than 200 St. Louis College of Pharmacy (STLCOP) students have participated in international Advanced Pharmacy Practice Experience (APPE) rotations in 16 countries. After rotations, students reflected on their international experiences.

Purpose: To gain insight into student perception of how international learning experiences impact personal and professional growth, their rotation site, and STLCOP.

Method: Researchers compiled, de-identified, and reviewed one year's worth (n=32) of written international rotation reflections. Researchers created a mutually agreed upon codebook of operationalised themes; each reflection may have multiple themes. Two researchers coded each reflection separately; a third researcher reconciled discrepancies.

Results: Reflecting on personal learning, the most frequent themes were expanded knowledge of: international health systems (n=15), pharmacy practice differences (n=11) and other cultures (n=10).

Themes on learnings that helped the rotation site included: perspectives on U.S.A. pharmacy (n=16), disease and drug updates (n=10), participation in clinical care and pharmacy tasks (n=4) and experiential opportunities for local students (n=2).

Themes related to STLCOP benefits included internationalisation of campus (n=16), ambassadorship (n=4), marketing (n=2) and diversification of the curriculum (n=2). Some students struggled to provide complete or adequate responses to some reflection questions.

Conclusion: Analysis demonstrated that international rotations result in a perceived positive impact on students' personal and professional growth as future pharmacists and benefits for both the rotation site and STLCOP as an institution of higher learning.

Innovative experiential learning and clinical skills preparing APPE and practice-ready student pharmacists

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Background: The University of Pittsburgh School of Pharmacy offers a four-year professional degree programme (PittPharmacy) offering personalised education through innovative experiential learning, curricular assessment, and patient care documentation. PittPharmacy prepares students to be both Advanced Pharmacy Practice Experience (APPE)- and practice-ready.

Purpose: To describe how patient-centered experiential learning and clinical skills shape APPE- and practice-ready student pharmacists.

Method: Data describing the experiential learning curriculum were collected from a database of simulated, standardized, and real patient encounters. We defined 'APPE-ready' as applying knowledge, skills, and attitudes learned in pre-APPE settings and 'practice-ready' as clinical competence to provide medication management in practice. To assess APPE- and practice-readiness, we described patient encounter data in the pre-APPE and APPE curriculum, data from post-graduate residency match rates, and graduating student survey responses.

Results: The Pharm.D. Class of 2019 (n=113) encountered on average 61 patients (range, 32-92) patients in the pre-APPE curriculum, compared to 266 patients (range, 110-636) in the APPE curriculum. PittPharmacy's 2019 residency match rate was 84.7% (n=59) compared to the national average 67.0% (n=4,617). Data from the 2019 graduating class showed that 71.6% of students strongly agreed that APPEs were of high quality. Likewise, 94.1% students agreed that their IPPEs were valuable to prepare for APPEs.

Conclusion: PittPharmacy students collaborate as competent members of interdisciplinary teams to advance patient care. Student readiness can be attributed to the unique clinical preparatory experiences embedded in the University of Pittsburgh curriculum.

Minors/concentrations in pharmaceutical care (PC)

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Background: The Minor are curricular itineraries made up of optional subjects. Pharmaceutical Care minor (PC), has a consolidated training approach in the field of healthcare, is built as a strong programme based on the experience of our institution and an extensive network in the healthcare sector.

Purpose: To offer to undergraduates a preparation in specialised skill in pharmacy practice

Method: PC concentration has the following features:

- All the subjects have Master's level which allows the students to direct access to Ph.D.
- All the subjects are mandatory within the concentration.
- There are four theoretical subjects and practical training with a total of 36 ECTS.
- Minor-oriented practical placing is mandatory and performed for a period of three months at a related institution.
- Include subjects not common in undergraduate; Quality and Safety in Drug Use, Evidence-based Pharmacy, Organisation of community pharmacy services and Pharmacy practice in chronic disease.
- Within the framework of different subjects, workshops are included and involve the participation of professionals from different sectors of pharmacy practice.
- Students participate in clinical simulations that allows them to work differently skills.

Results: During 2019-2020, 15 students have chosen PC. Placements are distributed in 1 scientific/regulatory consultancy, 2 research institutions, 9 hospitals and 2 pharmacy administration. There were 8 workshop (ex. orthopaedics, pharmacogenetics in patient safety, digital strategy in pharmacy).

Conclusion: It gives to the student an important degree of specialization and approach to the professional environment. This methodology allows the student to integrate other important skills in pharmacy practice.

Resource use assessment for pharmacy skills labs involving Pharmacists' Patient Care Process (PPCP) activities

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Background: The Pharmacists' Patient Care Process (PPCP) is a fundamental component throughout pharmacy the programme curricula in developing practice-ready pharmacists. Currently, no data exists regarding resources needed to successfully implement and support PPCP-related learning in pharmacy skills lab courses.

Purpose: To evaluate resources allocated towards skills-based lab courses focused on PPCP-related, direct patient care activities.

Method: A 44-item, benchmark, pilot survey consisting of multiple-choice, open-ended and Likert scale questions was created by skills lab faculty from five Big Ten pharmacy schools. Surveys evaluated skills lab course structure, curricular design, PPCP-related skills education and assessment, and resources. Surveys were completed electronically. Data were analysed using descriptive statistics.

Results: Most (8/9) of the Big Ten schools assessed have stand-alone lab courses, while one is integrated with pharmacotherapy lecture. On average, PPCP content is taught across five courses (range: 4-6). Students spend about 160 minutes weekly in labs with 48 students (average) per session. Common lab personnel support across all programmes include pharmacy residents and Advanced Pharmacy Practice Experience students. On average, faculty spend twice as much time preparing for (1096 hours) than teaching (695 hours) labs. Most faculties have adequate space, funding, and supplies to run courses. Personnel and time to adequately teach PPCP were identified as areas of need.

Conclusion: Although resources for teaching and assessing PPCP-related content in skills labs vary across peer Big Ten institutions, personnel support and time are common areas of need. Future research will further assess lab skills resource needs and use across United States pharmacy schools.

Meeting educational needs of pharmaceutical stakeholders: Community practice

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Background: A relevant level of competence of the community pharmacy working team is essential to meet the expanding scope of patient-focused practice.

Purpose: To describe pharmacy support staff structures in community pharmacies in Malta and to identify education and training needs for pharmacy support staff.

Method: A validated self-administered questionnaire was disseminated to 30 managing pharmacists practicing in pharmacies which are part of a group and 30 managing pharmacists practicing in independent pharmacies. The questionnaire addressed pharmacy support staff structure, expected skills, health care services which pharmacy support staff could be trained on, and additional educational and training needs.

Results: Forty-five (45) responses were received. The pharmacy support staff structure consists of salespersons in 42 pharmacies, pharmacy student trainees in 22 pharmacies and pharmacy technicians in ten pharmacies. Motivation to learn (n=38), to be patient-focused (n=36), enthusiastic (n=34) and accurate (n=32) were rated as 'very important' pharmacy support staff skills. An area identified by the majority of the respondents (n=41) where support staff could receive additional training is related to reducing drug wastage and educating patients on drug waste management. Thirty-one (31) pharmacists considered that improving pharmacy-related knowledge of pharmacy support staff would free up time for community pharmacists which they can dedicate for clinical tasks.

Conclusion: Respondents identified areas that are relevant in the elaboration of short-courses intended for pharmacy support staff such as accuracy, documentation and patient education campaigns.

Navigating the science, the myths and the realities of COVID-19 pandemic

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Background: A number of challenges are faced by health systems and academia as the SARS-CoV-2 viral infection spreads to pandemic levels.

Purpose: To develop webinars presenting scientific evidence and reflecting on the challenges in navigating the science, myths and realities of COVID-19 pandemic. The webinars were intended to develop an inter-professional dimension to the discussion by analysing current research, practices and applications proposed by institutions within the international scenario.

Method: A series of webinars was prepared and presented every week, each of a duration of 45 minutes with 15 minutes discussion. For each webinar, a panel of experts including virologists, immunologists, specialists in infectious disease, internal medicine and intensive care, pharmaceutical and public health regulators.

Results: Eight webinar topics were presented covering the presentation of the infection, the rationale for re-positioning of medicines, on-going clinical trials, medical devices and use of personal protective equipment, scientific-evidence related to containment measures, laboratory investigations and interpretation, development of vaccines and the consequences of lockdown such as affordability, social health and well-being. Each webinar was followed by an average of 250 participants. Participants consisted mainly of health professionals including students and academics from the University of Malta and other international academic institutions.

Conclusion: The webinars served to present an analysis of scientific evidence within an inter-professional discussion and sharing of experiences and data.