Monash MyDispense Symposium 2018

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Simulation Teaching Innovation Posters

STIP1: Economic consideration of patient high fidelity simulation system

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Keywords: Simulation, Economic, Apprenticeships, Education, Pharmacy

Aim: The effective use of simulation in medical education was approved by many studies (Okuda *et al*., 2009). The advantages of the simulation system encourages its usage in the innovative pharmacy education system. Less ethical concerns, controlled and safe education environment and clinical site response are main logical advantages of this system. Whereas increase in self-confidence, decrease in performance stress, increase in knowledge and subsequently decrease in medication error are the desired educational outcomes (Carroll & Messenger, 2008). The study aims to evaluate the economic impact of using simulation system in clinical pharmacy apprenticeships.

Methods: Calculate the cost/student/day for the real field clinical apprenticeship using data from the financial Office of Altinbas University and compare it with the cost of simulation system (METI Man HPS (CAE)).

Results: The cost of real field clinical apprenticeship is 12US$/student/day. For 100 students the cost for 60 days (the mandatory apprenticeship) for one year was 72,000US$. The cost of METI Man HPS (CAE) is 200,000US$ (Lapkin & Levett-Jones, 2011).

Conclusion: The results show that the cost of high fidelity simulation system is a worthwhile investment for long term. The average cost of the unit can be covered within three years and after these years the cost of apprenticeship will be nearly free.

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STIP2: Resources needed to implement a comprehensive assessment of the Pharmacists' Patient Care Process in a simulation-based laboratory course

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Keywords: Pharmacy Education, Simulation Training, Patient Care

Aim: To describe the resources needed to implement a comprehensive assessment of the Joint Commission of Pharmacy Practitioners Pharmacists' Patient Care Process (PPCP) in a required simulation-based laboratory course.

Methods: First year student pharmacists enrolled in a laboratory course were taught to apply the PPCP through weekly-simulated activities and individualised assessments using two longitudinal patient cases. The comprehensive final assessment involved a single patient case and students sequentially progressed through six PPCP stations. The stations included: 1) electronic health record, 2) patient interview, 3) assessment and plan, 4) presentation to preceptor, 5) medication education, and 6) documentation. The exam was administered over two 10-hour days. Students completed two stations on day one and were given a full day to develop an assessment and plan before completing the remaining stations on day two. Individual student time commitment was two hours each day. Live assessments were performed in simulated patient exam rooms with standardised patients/preceptors. Resources needed to implement this assessment were evaluated.

Results: One hundred and forty-four students completed the assessment. On day one, implementation resources included: two faculty, one administrative staff, twelve post-graduate teaching assistants (TAs), four student TAs, eight standardised patients (SPs), eight patient care rooms, and three classrooms. On day two, implementation resources included: two faculty, two administrative staff, twelve post-graduate TAs, two student TAs, seven SPs, fourteen patient care rooms, and two classrooms.

Conclusion: While a comprehensive assessment of the entire PPCP is resource intensive, it is a unique teaching method to enhance student learning and prepare for patient encounters during initial clinical experiences.

STIP3: Providing training of the dispensing process and procedures in a high fidelity environment high fidelity simulation experiential learning

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Keywords: High Fidelity Simulation, Experiential Learning

Aim: To describe the implementation of high fidelity training in a live hospital dispensary to teach about medication dispensing processes and procedures in an undergraduate pharmacy programme.

Methods: The live dispensary of a large teaching hospital served as the location, setting and resources to provide undergraduate pharmacy students the opportunity to develop skills and knowledge. Students were required to undertake legal and clinical checks and process mock patient hospital prescriptions using true-to-life dispensing systems and medications. Students were required to record their experiences in their professional portfolio in the form of blogs. Blog entries were analysed *via* content analysis to investigate the nature of student observations and reflections. Students are debriefed by academic staff on the dispensing sessions. At this stage no further online simulated materials or platforms, *e.g.* MyDispense, have been employed to support learning.

Results: One hundred and two blog entries were retrieved from the professional portfolios from 48 students across four dispensing sessions. Observations and experiences reflect the specific dispensing activities but also demonstrate evidence of students developing their understanding of professional identity.

Conclusion: The high fidelity teaching of students about the dispensing process in a live dispensary supports the development of knowledge and skills. The work-based nature of this approach provides experiential learning opportunities for students to observe and participate in the professional community of practice.

MyDispense Research Posters

MRP1: Effects of virtual simulation on students' ability to assess self-care patient cases

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Keywords: Simulation, Pharmaceutical Education, Evaluation

Aim: To evaluate the effectiveness of virtual simulation on students' ability to assess and formulate a plan for patients seeking self-care and to describe student perceptions of virtual simulation in self-care pharmacy education.

Methods: In a third-year course, students are assessed on their ability to make a recommendation for a patient seeking self-care. This assessment is a standardised patient (SP) case graded using a checklist. Previously, students prepared by participating in workshops and lectures only. This year students continued workshops and lecture but MyDispense was also assigned. Student performance after using MyDispense (Class of 2019) was compared to the previous year (Class of 2018). Six cases were used for the SP assessment. Maximum possible score was 20. A survey was administered to the Class of 2019. Statistics used were chi-square, Fischer's exact, *t*-test and descriptive as appropriate.

Results: Data from 135 students in the Class of 2019 were compared to 175 students in the Class of 2018. No differences were detected between the mean total scores of all cases when the Class of 2019 was compared to Class of 2018 (16.89 vs 17.22, respectively). A significant difference was only detected for Case 4 (15.91 vs 18.02, 2019 vs 2018 respectively, $p < 0.001$). Significant differences on the checklist were identified for six items ($p < 0.05$). Survey response rate was 12.5%. Over 90% of students agreed or strongly agreed they will be able to apply what they learned in MyDispense to their future practice.

Conclusion: Virtual simulation may impact students' ability to make self-care recommendations. However, not all changes identified were positive. Students did positively review MyDispense and felt it was useful as they prepared for future practice.

MRP2: Integration of MyDispense in a Doctor of Pharmacy curriculum in the U.S.: Lessons learned

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Keywords: Curriculum, Instruction

Aim: To determine if MyDispense was the appropriate technology to teach prescription processing in the community practice setting in a Doctor of Pharmacy programme. To determine appropriate placement in the curriculum for this learning, and to implement the technology and evaluate outcomes.

Methods: Faculty built the infrastructure, learned the programme, developed learning units, and pilot tested the learning units. Additional learning units were added to additional courses after the pilot test. Evaluation of the technology included a short survey to students and informal conversations with faculty.

Results: Students indicated a high level of satisfaction with the learning technology and demonstrated reasonable usage of the practice and graded assessments. Faculty comments indicated further integration of the technology in the curriculum was warranted. Additional courses and learning units were identified and developed.

Conclusion: MyDispense was effective in teaching prescription processing in the community setting. In addition, learning units were developed to teach students how to provide over-the-counter medication recommendations to patients. Sufficient faculty and staff resources are critical to successful implementation.

MRP3: Connecting two pieces of separate puzzles: A MyDispense experience

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Keywords: Simulation, Pharmacy

Aim: Our Master of Pharmacy students apply their learning and hone skills in simulated learning (SL) tutorials. Clinical tutors role-play prescription based scenarios with students who, as the pharmacist, greet the 'patient', gather information and determine appropriateness then dispense and supply the medicine with advice to the 'patient'. Simulating dispensing environments on campus raised issues not faced in community pharmacy: •maintaining 20 computers and label printers with regular dispensing software updates and recurrent networking issues; •maintaining medicine stock that was current in sufficient quantities We decided to trial MyDispense to address these issues. The multi-device support provided by MyDispense allows students programme access on their own devices on and off campus. It also eliminates the need for printers and holding medicine stock.

Methods: System capabilities and limitations in order to meet tutorial learning outcomes were identified. IT set up of 'single sign on' capability. Existing scenario information was transferred to suit MyDispense format then beta tested. A training workshop was developed and delivered to tutors to familiarise them with MyDispense. Similarly, a workshop was developed and delivered to students to walk them through the MyDispense dispensing process. Students were provided with a number of sample cases to practise with prior to the first SL tutorial.

Results: We reflected on the two models post trial. Students and tutors adapted quickly to MyDispense preferring it to the old model. The change encouraged us to re-evaluate tutorial learning outcomes.

Conclusion: This year we will trial separating the procedural aspect of dispensing from cognitive and communication skill development.

MRP4: Integration of MyDispense in an experiential education programme to improve student preparedness of prescription processing and medication safety

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Keywords: Pharmaceutical Education, Pharmacy, Simulated Environment

Aim: Evaluate student preparedness for community introductory pharmacy practice experiences (IPPEs) using MyDispense at UConn School of Pharmacy.

Methods: First-year pharmacy students and their assigned community IPPE pharmacist preceptors were eligible to participate. Students were divided into four groups based on previous community pharmacy experience (> or < 50 hours) and randomised to complete 40 MyDispense exercises before starting IPPE or after 24-32 hours of IPPE. Preceptors were blinded to their student's group and completed a six-item readiness survey after the student completed 24-32 IPPE hours. Following exercise completion, students were to complete an anonymous eight-item survey evaluating their performance and use of MyDispense. All surveys were administered using Qualtrics. Descriptive statistics were used to characterise data.

Results: Two cohorts enrolled in consecutive years: Cohort I (88 students, 27 preceptors) and Cohort II (22 students, 19 preceptors). In both cohorts, students felt confident in their ability to manage assigned tasks with median Likert scores of 3-4 (5-point scale). Preceptors displayed less confidence in students with varying median scores of 2-6. In first cohort, preceptors rated students lower than the students themselves on dispensing activities ($p<0.001$), but not counselling activities. Students who completed the exercises before rotation received higher preceptor scores for patient counselling than those who did exercises after starting rotation ($p<0.0047$); results of Cohort II and combined data will be presented at symposium.

Conclusion: MyDispense can be an effective teaching tool for students before beginning community practice rotations. Refinement and implementation of MyDispense into this course will be discussed.

MRP5: Use of MyDispense pharmacy simulation programme in integrated review of pharmacy law

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Keywords: Pharmacy, Pharmaceutical Education, Law Related Education

Aim: At UConn School of Pharmacy, students receive formal pharmacy law instruction in the second professional year and a review immediately before graduation; yet feel unprepared for licensing examination. The aim of this study was to evaluate student perceptions on need for additional law instruction and use of MyDispense for this instruction.

Methods: This Institutional Review Board–approved study was conducted in a case study class attended by all eligible professional Year 3 students. Students were required to complete eight MyDispense exercises individually before class and five exercises within groups during class. Participating students completed a survey on the use of MyDispense for pharmacy law review, including the timing of review, exercise content, and applicability/comprehensiveness of exercises. The survey was administered through Qualtrics.

Results: Thirty-eight students (41%) completed the survey. Overall, students felt exercises improved their understanding of pharmacy laws and were more challenging than previous lectures; mean scores > 3 (4-point Likert Scale). Additionally, most students felt MyDispense improved recall (86.5%) and was more enjoyable (71%). Student-recommended future topics include state laws versus pharmacy policies; and suggested removal of prescription verification exercises. Students felt certain topics were not suited for simulation (eg. prescription fraud) and some were irrelevant to practice experiences.

Conclusion: Pharmacy practice law is a valuable topic for review after formal instruction and before licensing examination. Using MyDispense for this review was well-received with room for improvement to content and answer explanations. In the future, MyDispense will be used in conjunction with lecture-based law reviews.

MRP6: Implementation of a virtual dispensing system (MyDispense) into the M.Pharm. curriculum at the University of Manchester

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Keywords: Pharmacy, Simulation

Aim: The Manchester M.Pharm. curriculum teaches the fundamental knowledge and skills of law and dispensing in the 2nd year of the programme, via the 'Pharmacist' unit. This unit is integrated so that the teaching of the relevant law is aligned with dispensing classes where students get to apply their knowledge to simulated prescriptions in a safe environment. Student feedback suggests that although they are satisfied with the teaching and learning experience they would value additional experience of the processing of prescriptions. Our aim, therefore, was to increase prescription processing opportunities within the M.Pharm. through the introduction of the MyDispense virtual dispensing system.

Method: Staff are working with academics from other UK Schools of Pharmacy along with the developers in Monash to develop an authentic system to simulate prescription processing in the UK. Second year students have the opportunity to undertake prescription validation and simulated dispensing activities following each dispensing class to consolidate their learning. At the end of each semester student engagement with the system will be analysed via the completion rates for each of the activities.

Results: Data from the first half of the academic year suggests that more than three-quarters of students have engaged with the MyDispense system and more than half are regularly undertaking the simulated activities.

Conclusion: Informal feedback suggests that students enjoy learning in this way at a time convenient to them. We now intend to survey the students at the end of the unit about their engagement with MyDispense and the correlation between student performance in end of year exams and their MyDispense usage will be explored.

MRP7: Use of online simulation in a required self-care therapeutics course

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Keywords: Simulation, Pharmacy, Classroom Research

Aim: To incorporate an online simulation (OS), MyDispense, in a first-year self-care therapeutics course and evaluate student perceptions and confidence in providing self-care recommendations.

Methods: Students completed 31 cases during the semester (four were randomly selected to be graded), three cases as part of the final exam, and an online survey at the end of the semester. Results were analysed using descriptive statistics and independent-samples t-tests and p-value <0.05 was significant. This project was exempt by the Institutional Review Board.

Results: Eighty-five students used the OS in winter 2017. Most students were 20-24 years old (n=71, 83.5%) and female (n=57, 67.1%). Many students (n=52, 61.2%) had experience working in a community pharmacy. Student reported mixed feelings about whether the OS was a valuable tool for learning the course material (agree, n=40, 47.1%; neutral n=22, 25.9%); however, they agreed that it aligned with course material (n=72, 84.7%). Cases often took 41-50 minutes to complete. Average grades increased from 80.9% for case 1 to 99.4% for case four and students earned an average of 96.5% on the OS portion of the final exam. At the end of the semester, students with community pharmacy work experience had higher confidence related to collecting data, assessing data, and selecting a medication regimen, but not providing patient education, triaging patients to the correct level of care, or creating a follow-up plan.

Conclusion: Students had mixed perceptions about using OS to learn self-care material; however, their ability to accurately complete cases increased throughout the semester.

MRP8: Use of MyDispense to dispense extemporaneously − prepared formulations

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Keywords: Extemporaneous, MyDispense, Labels

Aim: To develop approaches for students to dispense and prepare labels for prescriptions of extemporaneous formulations using MyDispense.

Methods: Prescriptions for solutions, suspensions, creams and ointments were developed in MyDispense and released to students at least one week prior to the practical class to allow dispensing and printing of labels in advance of the class. Special programming was developed to ensure most components of dispensing an extemporaneous formulation were captured (*e.g.* formulation name, dosing instructions) and to ensure an appropriate label size could be generated as a PDF.

Results: All students engaged with MyDispense and prepared their labels prior to entry to the laboratory class. Over a six-week period, more than 1000 labels for extemporaneous formulations were created. Informal student feedback suggests the process was seamless and built upon dispensing activities in Year 1.

Conclusion: MyDispense is a useful tool which can be adapted for dispensing prescriptions for extemporaneously-prepared formulations.

MRP9: Monera−Penduka, Tsitsi Collaborative development of a virtual Pharmacy Practice skills laboratory at the University of Zimbabwe School of Pharmacy

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Keywords: Pharmacy Education, Skills, Virtual Classroom, Teacher Collaboration

Aim: To improve the clinical skills and confidence of pharmacy graduates at the University of Zimbabwe, a virtual pharmacy software was collaboratively developed with the University of Monash.

Methods: MyDispense software was customised by activating or adding drug products that are registered with the national drug regulatory authority (NDRA) and included in the essential medicines list (EMR). Detailed drug picture profiles were created. Patient profiles were also created, and a custom face assigned to each profile. Practice exercises meeting the objectives of third and fourth year Pharmacy Practice courses were then developed. A randomly selected group of third year students who gave consent, were given a Pharmacy Practice pre-test and then given access to the customised version of MyDispense for two weeks.

Results: Of the 2437 active drug profiles on MyDispense, 42 were found on the NDRA register and included in the local instance. Another 188 drug profiles incorporating alternative dosage forms, strength and brands were developed from EML drugs available in retail pharmacies in Harare. Twenty-one unique patient profiles were then created, differentiated by disease, age, sex ethnicity, residential location and common name variations. Nineteen of the 20 students who took the pre-test managed to access MyDispense via Wi-Fi or broadband. Despite connectivity problems during peak times, 82% of the students felt that the exercises helped in preparing them for practice in the real world.

Conclusion: Collaborative programming can be implemented successfully to scale-up and improve quality of pharmacy education in resource-limited countries. Pharmacy students in developing countries like Zimbabwe are capable and eager to engage with ICT methods of teaching.

MRP10: Student pharmacist performance on an Objective Structured Clinical Examination (OSCE) using community pharmacy simulation (MyDispense)

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Keywords: Pharmaceutical Education, Pharmacy, Computer Simulation, Clinical Experience, Learning Activities

Aim: To evaluate student performance on an Objective Structured Clinical Examination (OSCE) using MyDispense to measure competency on the medication use process.

Methods: MyDispense is an international community pharmacy simulation designed to provide students opportunity to learn the medication use process (Costelloe, 2017). MyDispense has been implemented at multiple colleges of pharmacy in the United States (US) to provide opportunity for student pharmacists to develop dispensing skills in the medication use process for community pharmacy practice (Ferrone *et al*., 2017). To date, MyDispense has been integrated across the six-semester Patient-centered Care Experience (PaCE) simulation sequence at the University of Kentucky College of Pharmacy. In autumn 2017, MyDispense was included on the OSCE assessment for 285 students (137 PY1; 148 PY2). Aggregate, anonymous administrative data will be used to identify metrics for high student performance. Analysis will be conducted with SPSS (IBM Corporation, Armonk, NY, Version 23).

Results: The analysis is currently a work in progress. Analysis planned includes comparison of PY1 versus PY2 students on aggregate OSCE performance including competency while identifying metrics significantly correlated with assessment performance.

Conclusion: The authors plan to identify student metrics that predict success in meeting competency on an OSCE evaluating medication use process using MyDispense.

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