

A Report of Second Year Pharmacy Students' Experience after Using a Virtual Dispensing Program

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Abstract

Objective: The purpose of this study was to report second year pharmacy students' experience after using a virtual dispensing program.

Methods: Thirty three second year pharmacy students were invited to participate in this study, after completing 14 three-hour tutorials using a virtual dispensing program, over two semesters. They completed a survey consisting of; three demographic questions, 20 unpaired items requiring responses on a Likert Scale and three open-ended questions about their views and recommendations for enhancing their learning experience. A focus group discussion was conducted to allow the students to elaborate on their open-ended responses. Students' responses were analyzed qualitatively and quantitatively using summary statistics.

Results: All the students (100%) "agreed" or "strongly agreed" that the virtual dispensing program was a useful pharmacy practice learning tool. They reported that it improved their understanding of the dispensing process (97%), the legal and professional requirements for dispensing prescription medicines (94%), as well as other pharmacy practice material taught in lectures (97%). Only 18% "agreed" or "strongly agreed" that the virtual dispensing program did not facilitate their learning. Modifying the characteristics and appearance of the avatars used in the program to match the local context, augmenting virtual dispensing tutorials with hands-on dispensing experience using commercially available dispensing programs and observational placements at community and hospital pharmacies, are some of the recommendations made by students to enhance their learning about the dispensing process.

Conclusion: Overall the students in our study were satisfied with the use of a virtual dispensing program in learning about the dispensing process. They enjoyed using the program and found it to be a beneficial tool for pharmacy practice education.

Keywords: Pharmacy practice; Education; Virtual program; Dispensing

Introduction

Teaching the core skills of safe and accurate dispensing within a framework of quality use of medicines is an important aspect of pharmacy education. Most pharmacy school curricula, place large emphasis on education in basic pharmaceutical sciences e.g. pharmacetics, pharmacokinetics, pharmacology, and professional pharmacy practice including extemporaneous dispensing, law and ethics and communication. With much of the experiential learning occurring intermittently during placements then post-graduate internship programs at the end of training. This may be due to deficits in clinical sites, time limitation and already full curricula [1]. Pharmacy programs also aim to provide an opportunity for theoretical knowledge to be applied to real clinical settings. In light of this, virtual and simulated learning environments could enable a systematic approach to training in clinical skills, basic sciences and pharmacy practice by providing students with consistent, predictable experiences [2-3].

The use of virtual technology in education incorporates software computer programs and applications into the teaching curricula to improve student learning. MyDispense is a virtual, web-based pharmacy simulation program, developed by Monash University Faculty of Pharmacy and Pharmaceutical Sciences, to assist undergraduate pharmacy students in learning best-practice dispensing skills. Fatima College of Health Sciences (FCHS) was established in 2006, with the aim to meet the United Arab Emirates' growing need for National skilled healthcare professionals. The College offers High Diploma and Bachelor degrees in different Health Sciences Specialties including Pharmacy, Physiotherapy, Medical Imaging, Nursing and Paramedics. The Bachelor of Pharmacy Program at FCHS follows Australia's Monash University Pharmacy Curriculum.

Research into the use of simulation for healthcare education is implemented in medicine [2-4] and undergraduate nursing [5-7] and to a lesser extent among pharmacy students [8,9]. In relation to pharmacy education, anecdotal evidence suggests simple simulation techniques such as role plays and case studies are currently being used and have been for many years. There is some research available for the use of more complex and immersive experiential simulation techniques that have been used in pharmacy schools, to teach a range

of technical and non-technical skills, including critical care [10], interdisciplinary teamwork [11], and pharmacotherapy skills [12].

At this stage, we do not fully understand the extent of the use of simulation techniques within pharmacy school curricula, further research into this area is required. To the best of our knowledge this the first study to report on the use of a virtual dispensing program in pharmacy practice education.

Methods

Thirty three second year female pharmacy students consented and took part in this study. The students were from both FCHS campuses in Abu Dhabi and Al Ain. The students were asked to complete a survey about their experience and perceptions after using MyDispense in their pharmacy practice tutorials. A total of 14 (3-hour) tutorials were completed in the two semesters of that year. The survey was anonymous; student names or ID information were not collected. The study received institutional review board approval prior to initiation.

The tutorials covered beginner features of the program for example reading prescriptions, generating dispensing labels, and intermediate level features such as selecting and scanning medicines, accessing the safe for controlled drugs, record keeping in a controlled drug register, medicines assembly and hand-over to patient. Additional features that are more advanced and require considerable skills and experience for example fact-finding from a patient or doctor and patient counselling have not yet been covered, and hence were not included in this study.

The survey instrument consisted of 20 unpaired questions on student's experience and perceptions of MyDispense and required responses on a Likert Scale ranging from strongly disagree (1) to strongly agree (5). Focus group discussion was conducted to allow the students to elaborate on their responses to the open ended questions. Student responses to the open ended questions were transcribed and coded for common themes manually.

Results

Average age of students was 21.3 years old. All students reported being comfortable with using new technologies, 63.6% played computer games. All of the students (100%) "agreed" or "strongly agreed" that MyDispense virtual dispensing program was a useful pharmacy practice learning tool. The students reported that the program improved their understanding of the dispensing process (97%), the legal and professional requirements for dispensing prescription medicines (94%), as well as other pharmacy practice material taught in lectures (97%). Only 18% "agreed" or "strongly agreed" that MyDispense did not facilitate their learning. Although the students highly enjoyed using MyDispense, a majority (91%) expressed interest in getting hands-on experience using commercial dispensing programs, in addition to using virtual dispensing. The students expressed many positive views, a few negative views and some recommendations to enhance learning using MyDispense virtual dispensing program. These are summarized in the (Table 1) below.

Positive Views	Negative Views	Recommendations
<p>An innovative preliminary tool that gives good dispensing practice before working with real prescriptions and patients.</p> <p>Accessibility of the program; students found it easy to access and very user friendly.</p> <p>Thorough feedback; students believed the feedback enhanced their knowledge and improved their outcomes in the final assessments.</p> <p>Students emphasized the great details about the medicines included in MyDispense; the variety, clear images and locations of storage.</p> <p>Contributes to developing students' professional identity as future pharmacists.</p>	<p>Frustrations due to technical computer or system errors.</p> <p>Lack of cultural authenticity of the patients (e.g. names and images)</p> <p>Artificial nature of the virtual dispensing tutorial which takes place in a computer lab without exposure to clinical pharmacy practice settings during the course.</p>	<p>Design the avatars in MyDispense to match the characteristics of patients in the local setting e.g. features, attire etc.</p> <p>Equip MyDispense with electronic resources.</p> <p>Augment the learning experience using virtual dispensing with observational placements at local hospitals or community pharmacies; and or invite real patients to workshops.</p> <p>Run the MyDispense tutorials in a MyDispense lab with a setting that mimics a real pharmacy; including a dispensary area with sample medications and demos, pharmacy back room, commercial dispensing program.</p>

Table 1: Students views

Discussion

The findings of our study are similar to findings published in the literature. Cavaco and colleagues reported that 83.5% of students supported the integration of virtual patient technology within their curriculum [13]. Their students strongly believed that the use of virtual technology is a good asset for education. Female students showed greater confidence in the use of technology to improve their communication. Furthermore Divall et al, found that 78% of students agreed that the integration of virtual technology in their curricula increased communication between faculty members and students on a professional basis [14].

The reason as to how virtual patient technology increases student confidence is that such programs give students experience with lifelike situations before their actual practice. Virtual technology allows students to practice different scenarios and situations multiple times without jeopardizing the safety or health of real patients [13].

Significant improvement in knowledge, problem solving, communication and professionalism was reported upon completion of an assessment using virtual patients among third year PharmD students [15]. The assessment tool allowed students to engage with virtual patients on professional and ethical level. The authors concluded that such training equip students before entering clinical grounds to deal with similar situations. Also, Jabbur-Lopes and colleagues assessed the use of virtual technology and students' proficiency in pharmaceutical care interventions and their ability to solve clinical cases. Their students found the programs to be stimulating, innovative and highly applicable to the practice of pharmacy. It allowed them to train in their early years of study with situations they would face as licensed pharmacists [16].

Another study evaluated 212 students also showed increased knowledge and understanding of theoretical aspects among students after the integration of virtual technology [17]. Marriott and colleagues

stated that virtual technology can be used to bridge the gap between theory and practice. They assessed the incorporation of a virtual database into teaching activities and found that such integration provided students with a medium where they were able to build upon theoretical information and practice it through the virtual program. In real practice, students exhibited more knowledge, more confidence and greater competency [18].

Limitations

The small sample size which only included female participants, as FCHS is a women's college, is a limitation of this study. It is possible that male students might have different views and experience using virtual dispensing.

Conclusion

Students were satisfied with using virtual dispensing in their pharmacy practice tutorials. They found My Dispense a useful tool that helped them visualize and improve their understanding of the dispensing process. There is a paucity of research in the area of virtual technologies in pharmacy practice education. Further studies are needed to confirm the benefits of using virtual software applications on student learning outcomes.

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