

Virtual Software to Personalize Student Learning In A Required Pharmacy Course

Kayla Ambroziak, PharmD Student; Nour Ibrahim, PharmD Student; Vincent D. Marshall, MS;

Sarah E. Kelling, PharmD, MPH, BCACP

University of Michigan College of Pharmacy, Ann Arbor, MI



Introduction

- There is significant variation in the amount and type of experience related to pharmacy practice that students have prior to entering a professional pharmacy program.
- Historically, Pharmacy Practice Skills I (P504) at the University of Michigan has been taught using a traditional hands-on medication dispensing approach in a laboratory setting.
- Virtual simulation has been used in didactic and experiential health professions education settings to teach medication dispensing, preparation of intravenous medications, disease state management, medication therapy management, problem solving, decision-making, communication, professionalism, and interprofessional teamwork.¹⁻¹¹
- Students enjoy learning using simulation and the amount of learning is significant.¹²
- MyDispense is a customizable, open-access, virtual software program that allows students to develop and practice a wide variety of medication dispensing skills and receive immediate formative feedback after completion of each exercise.¹³

Goals

- To determine the applicability of virtual medication dispensing in preparing students for real-life medication dispensing compared to the traditional hands-on medication dispensing approach in a laboratory setting.
- To design a course in which previous professional experience is accounted for in learning activities in order to make the course relevant to each student.

Objectives

- To determine the utilization of virtual medication dispensing software in Pharmacy Practice Skills I lab based on previous pharmacy experience.
- To determine the effect of previous pharmacy experience and utilization of virtual medication dispensing software on student outcomes.
- To determine student perceived relevance and usefulness of the virtual medication dispensing program.

Methods

- Pharmacy students enrolled in the P504 course during fall 2015 (n=85) participated in this study.
- Student completed an electronic survey that identified their previous amount pharmacy practice experience.
- Students used the virtual simulation software to practice skills during lab in weeks 1-4, 8 and 11.
- After the introductory exercises during week 1 in lab, six optional practice exercises were made available one week in advance of each lab. There was a total of 30 optional practice exercises throughout the semester.
- The utilization of the practice exercises on the individual student level was collected from the virtual simulation program and students were classified as high (21-30), moderate (11-20), and low (0-10) users of the practice exercises.
- Scores from pertinent questions on the midpoint and final practical exams, and the overall course grade were collected for each student.
- Regression analysis and chi-square tests were used to assess utilization of the practice exercises and prior years of pharmacy experience on test scores.
- Students completed an online survey regarding their perceptions of using a virtual simulation medication dispensing program.

Results

Figure 1: Previous pharmacy experience

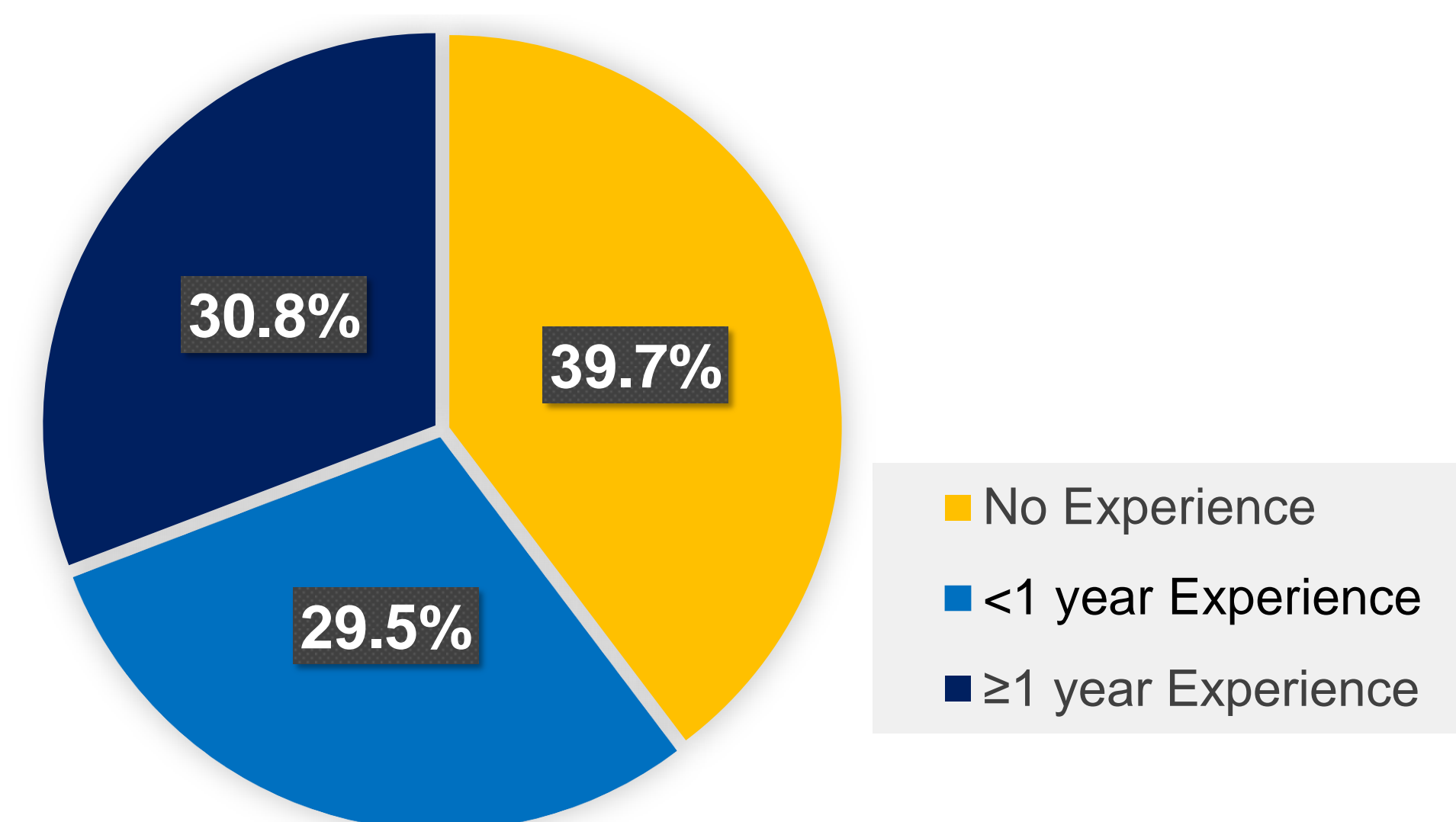


Figure 3: % of students who agreed that virtual simulation helped them practice the following skills:

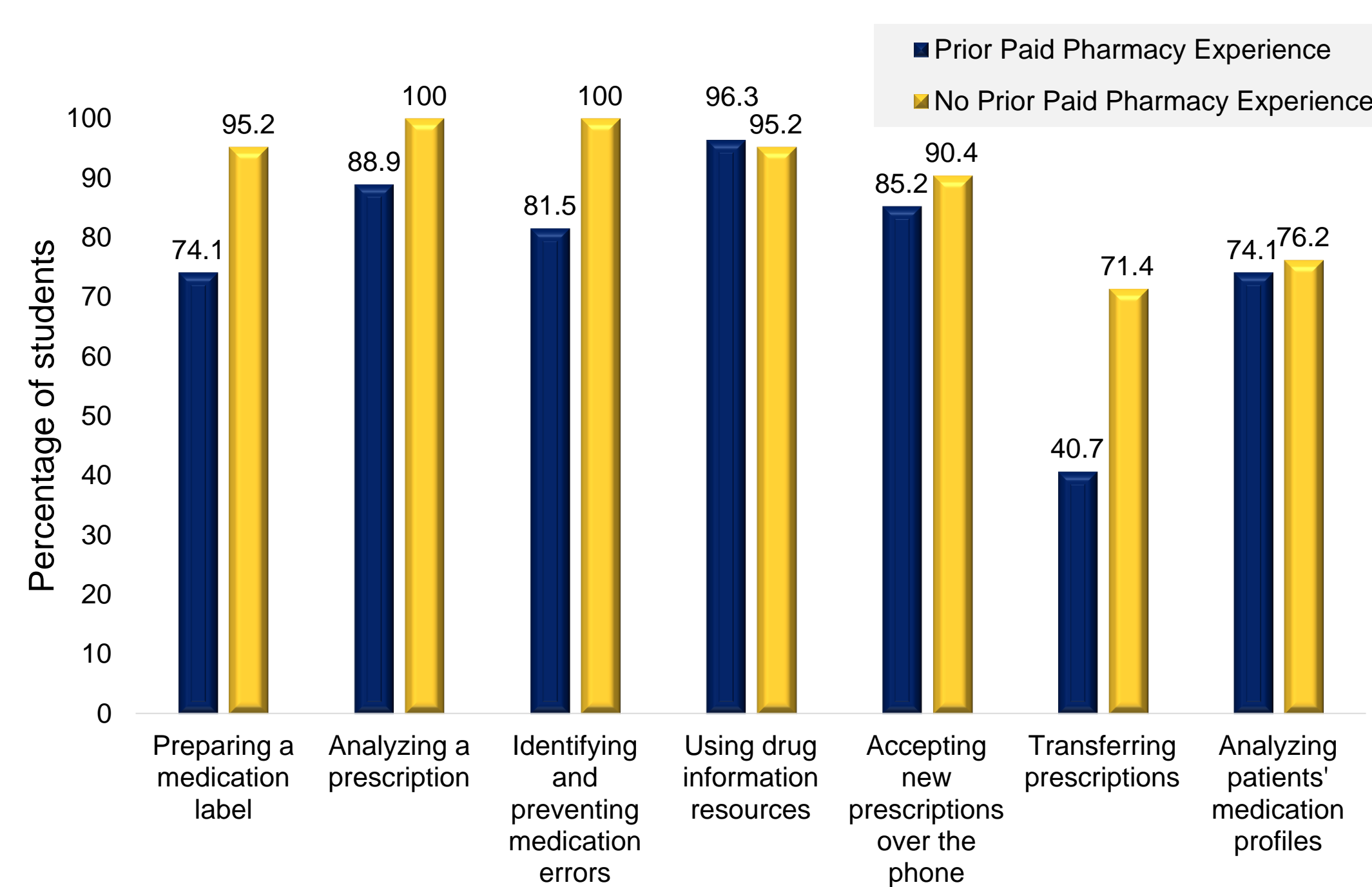


Figure 2: % of students who found virtual simulation useful in learning about medication dispensing

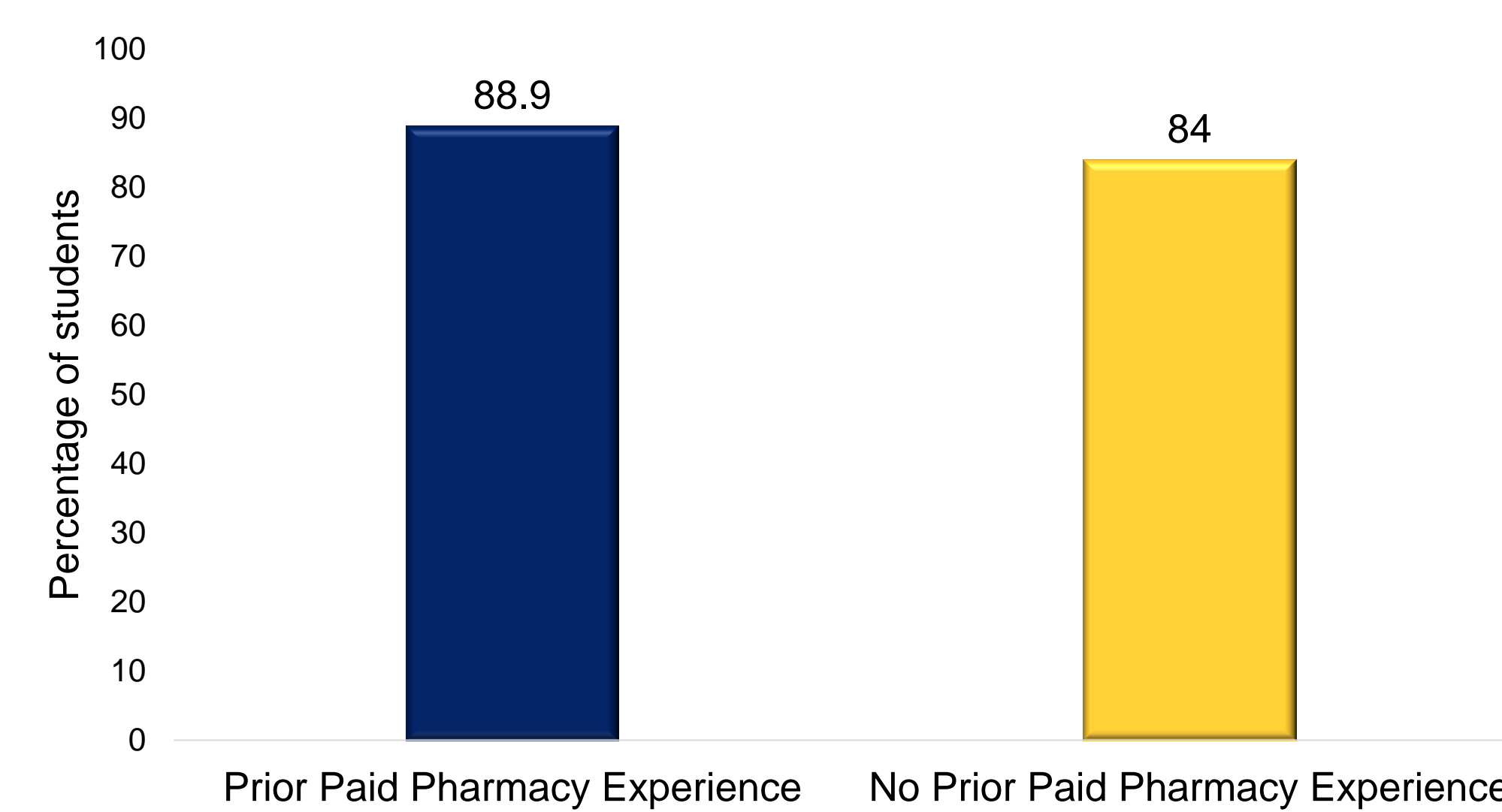


Table 1: Relationship between previous pharmacy experience and number of optional practice cases completed

Previous Pharmacy Experience	Number of Optional Practice Exercises Completed			Total
	0-10 Exercises	11-20 Exercises	21-30 Exercises	
No Experience	8 (25.8%)	9 (29.0%)	14 (45.2%)	31 (39.7%)
<1 year Experience	4 (17.4%)	13 (56.5%)	6 (26.1%)	23 (29.5%)
≥1 year Experience	7 (29.2%)	9 (37.5%)	8 (33.3%)	24 (30.8%)
Total	19 (24.4%)	31 (39.7%)	28 (35.9%)	78 (100%)

Results, cont.

- The amount of previous pharmacy experience ranged from none to more than one year (Figure 1).
- The majority of students—both with and without prior pharmacy experience—found virtual simulation to be a helpful tool for learning about medication dispensing in the outpatient setting (Figure 2).
- Students identified a variety of skills that were learned using the virtual simulation program (Figure 3).
- There was variation in the number of optional practice exercises completed (Table 1); however, the difference was not statistically significant.
- Linear regression did not show a relationship between previous pharmacy experience, number of practice exercises completed, and score on the virtual medication dispensing portion of the final exam.
- The most common elements of P504 that students reported helped them to learn medication dispensing were the virtual simulation program and lab practice.
- Areas for improvement include decreasing technology issues and ensuring that practice exercises align with material in other parts of the course.

Conclusions

- The virtual medication dispensing program allowed students to self identify the amount of practice that was necessary in order to gain specific skills.
- Virtual simulation was well received by the students and will be used during future semesters.

References

- Orr KK. Integrating virtual patients into a self-care course. *Am J Pharm Educ.* 2007;71(2): Article 30.
- Benedict N. Virtual patients and problem-based learning in advanced therapeutics. *Am J Pharm Educ.* 2010;74(8): Article 143.
- Patel S, Vincent AH, Abel SR, Jacobs CM, Dunlop SR, Seibert M. A virtual clean room to teach USP 797 regulations for intravenous medications. *Am J Pharm Educ.* 2011;75(1): Article 7.
- Battaglia JN, Kieser MA, Bruskiwitz RH, Pitterle ME, Thorpe JM. An online virtual-patient program to teach pharmacists and pharmacy students how to provide diabetes-specific medication therapy management. *Am J Pharm Educ.* 2012;76(7): Article 131.
- Hussaini SY, Styles K, Duncan G. A virtual practice environment to develop communication skills in pharmacy students. *Am J Pharm Educ.* 2012;76(10): Article 202.
- Seefeldt TM, Mort JR, Brockevell B, Giger J, Jordre B, Lawler M, Nilson W, Svien L. A pilot study of interprofessional case discussions for health professions students using the virtual world Second Life. *Curr Pharm Teach Learn.* 2012;4(4):224-31.
- Benedict N, Schonder, K, McGee J. Promotion of self-directed learning using virtual patient cases. *Am J Pharm Educ.* 2013;77(7): Article 151.
- Douglass MA, Casale JP, Skirvin A, DiVall MV. A virtual patient software program to improve pharmacy student learning in a comprehensive disease management course. *Am J Pharm Educ.* 2013;77(8): Article 172.
- Al-Dahr S, Bryant K, Kennedy KB, Robinson D. Online virtual-patient cases versus traditional problem-based learning in advanced pharmacy practice experiences. *Am J Pharm Educ.* 2014;78(4): Article 76.
- Smith MA, Mohammad RA, Benedict N. Use of virtual patients in an advanced therapeutics course to promote active, patient-centered learning. *Am J Pharm Educ.* 2014;78(6): Article 125.
- Eukel HN, Frenzel JE, Skoy ET, Pooker FL, Fitz AL. An introductory pharmacy practice experience using simulated patient care activities in a pharmaceutical care laboratory environment. *Curr Pharm Teach Learn.* 2014;6(5):682-91.
- Smith MA, Benedict N. Effectiveness of educational technology to improve patient care in pharmacy curricula. *Am J Pharm Educ.* 2015;79(1): Article 15.
- MyDispense. Monash University. <https://www.monash.edu/pharm/innovative-learning/technologies/my-dispense> Accessed 26 April 2016.

