

BRIEF

Assessing the Impact of an Early Clinical Experience on Student Learning about Ambulatory Care Practice

Emily J. Ashjian, PharmD, Steven R. Erickson, PharmD, Paul C. Walker, PharmD, Burgunda V. Sweet, PharmD, Heidi L. Diez, PharmD, Trisha Wells, PharmD, Amy N. Thompson, PharmD

University of Michigan, College of Pharmacy, Ann Arbor, Michigan

Corresponding Author: Emily J. Ashjian, University of Michigan, College of Pharmacy, 428 Church Street, Ann Arbor, MI 48109. Tel: 734-647-2058. Email: eashjian@med.umich.edu

Submitted April 22, 2020; accepted December 10, 2020; ePublished December 2020

Objective. To determine if student confidence in their knowledge of ambulatory care pharmacy and ability to contribute to patient care in this setting increased after participating in an ambulatory care introductory pharmacy practice experience (IPPE). To determine if an ambulatory care IPPE changed student interest in pursuing a career in ambulatory care pharmacy.

Methods. Second-year pharmacy students (n=86) completed a required ambulatory care experience which included four hours of didactic work and 13.5 hours of clinic experience with an ambulatory care pharmacist. Students completed an eight-question survey rating their confidence in their knowledge of ambulatory care practice and providing patient care in this setting, as well as their interest in a career in ambulatory care before and after the experience. A 5-point Likert scale was used to assess student confidence (1=not at all confident, 5=very confident) and interest in ambulatory care (1=not at all interested, 5=extremely interested). Wilcoxon signed-rank test was used to compare pre-post survey responses.

Results. Eighty-five pharmacy students completed both the pre- and post-survey. Pre- vs post-median scores increased from 3 to 4 in seven domains assessed. Student interest in a career in ambulatory care remained unchanged.

Conclusion. An ambulatory care IPPE increased student confidence in their understanding of ambulatory care pharmacy practice and caring for patients in this setting.

Keywords: introductory pharmacy practice experience, experiential education, ambulatory care

INTRODUCTION

The Accreditation Council for Pharmacy Education (ACPE) requires Doctor of Pharmacy curricula to include a minimum of 300 hours of introductory pharmacy practice experiences (IPPE) and a minimum of 1440 hours of advanced pharmacy practice experiences (APPE).¹ IPPE hours are equally divided between community and institutional health-system settings. APPE include four required settings (community pharmacy, ambulatory patient care, health-system/hospital pharmacy and inpatient general medicine); the remaining APPE hours are completed in elective settings. Prior to 2018, IPPE at our large public college of pharmacy included community (104 hours), hospital (104 hours), and a predominately inpatient focused direct patient care experience (52 hours); 47 IPPE hours were completed through various other professional practice activities, including shadow experiences and community health events.² Given the rapid expansion of ambulatory care pharmacy practice, we partnered with seventeen pharmacist preceptors (five faculty, twelve adjunct faculty) in their ambulatory care clinics in both primary care and specialty settings at our affiliated health system to create an ambulatory care IPPE. Impetus for developing an ambulatory care experience included feedback from graduating students collected through exit interviews, college-wide Town Hall meetings, and focus groups with second and third year students, indicating interest in earlier exposure to ambulatory care.

The success of innovative IPPE in increasing student confidence in their knowledge of clinical pharmacist roles and their ability to contribute to patient care has been demonstrated in previous studies.^{3,4} Mort and colleagues showed that exposure to clinical communication, pharmacy practice, and use of reference materials through an IPPE led to improved APPE performance.⁴ Hardy and Marshall described an innovative three-semester course that was created to emulate APPE with practice of clinical skills within the classroom. Student confidence increased from somewhat confident to confident/very confident following exposure to a virtual health system in a didactic environment.⁵ Dettra and colleagues investigated the impact of a three credit-hour didactic elective on pharmacy student understanding of and interest in ambulatory care pharmacy practice compared to those not enrolled in the elective. Students enrolled in the

elective demonstrated improved understanding of the role of ambulatory care pharmacists, however this did not translate into an increased intention to pursue a career in ambulatory care.⁶

Starting in fall 2018, all second-year students at our college of pharmacy were required to complete a semester-long ambulatory care IPPE. Building upon the types of experiences described above, we created an ambulatory care experience that uniquely included didactic, experiential (three 4.5-hour clinic sessions), and interprofessional components. Preceptors took a minimum of one and maximum of six IPPE students per semester. A 1:1 preceptor:student ratio was maintained for P2 Ambulatory Care IPPE students, however preceptors often had P4 APPE students and pharmacy residents on rotation concurrently. Prior to spending time with an ambulatory care pharmacist, students participated in classroom activities to learn more about ambulatory care pharmacy and the electronic medical record. After spending time in clinic with ambulatory care pharmacists, students participated in group discussions and completed a reflection based on their experience, including an interprofessional discussion about health care team member roles with students from our medical school.

The purpose of this study was to assess the change in student confidence in their knowledge of ambulatory care pharmacy practice, confidence in their ability to contribute to patient care in this setting, and interest in pursuing a career in ambulatory care following completion of an ambulatory care IPPE.

METHODS

Between September 2018 and April 2019, all second-year pharmacy students completed a semester-long ambulatory care IPPE. The experience included four hours of didactic work, two hours of interprofessional discussion, and 13.5 hours of clinic experience with an ambulatory care pharmacist.

After completing the IPPE, students were expected to be able to: 1) navigate the medical record demonstrating knowledge of where to obtain pertinent patient information in the ambulatory care setting; 2) apply components of the Pharmacists' Patient Care Process to the ambulatory care environment; and, 3) explain the role of the pharmacist and other members of an interprofessional team. Preceptors rated students' achievement of the learning outcomes as "satisfactory" or "unsatisfactory" using a standard evaluation form. The IPPE provided introductory level exposure to the Interprofessional Education Collaborative outcomes.⁷

Prior to starting the clinic experience, students completed online electronic medical record training and received didactic instruction focused on working up an ambulatory care patient and presenting to a preceptor. An introduction to ambulatory care visits was also provided to assist students in understanding what to expect during their time in clinic. Following completion of the clinic experience, all students presented a patient case from their clinic experience during a discussion session led by an ambulatory care preceptor. Active discussion was facilitated by the preceptor around each case presentation to allow students to compare and contrast their experiences with those of their peers who may have been assigned to a different type of ambulatory care clinic. Students concluded the IPPE with an interprofessional case experience focused on medication history taking that allowed them to partner with and learn from students from the school of medicine. They were placed in groups (one pharmacy and two medical students) and role-played taking a medication history. After each profession interviewed the patient, small group and full class discussion focused on differences in interview techniques between the disciplines and what was learned from the other discipline. Rotation evaluations for the IPPE and preceptor were completed by all students at the conclusion of the experience.

Students completed an eight-question survey to assess confidence in their knowledge of ambulatory care practice and skills applicable to patient care as well as interest in a career in ambulatory care before and after their clinic experience. The survey instrument was adapted from Smith and colleagues.³ Survey items included: role of the ambulatory care pharmacist on the care team; role of the ambulatory care pharmacist in caring for patients; ability to know where to obtain information in the electronic health record to help care for patients; ability to find literature to help contribute to the care of patients in the ambulatory care setting; knowledge of the role of patient counseling in the ambulatory care setting; knowledge of the role of motivational interviewing in the ambulatory care setting; and knowledge of how to apply the Pharmacist's Patient Care Process in the ambulatory care setting. A 5-point Likert scale was used to assess student confidence (1=not at all confident, 5=very confident) in each of these areas. The final survey question assessed the level of interest in ambulatory care pharmacy practice (1=not at all interested, 5=extremely interested). Pre- and post-survey results were analyzed using the Wilcoxon signed-rank test. The study was reviewed and given not regulated status by our Institutional Review Board.

RESULTS

Eighty-six second-year pharmacy students completed the ambulatory care IPPE during the 2018-19 academic year; 86 completed the pre-rotation survey and 85 completed the post-rotation survey. All students achieved the learning outcomes and were rated “satisfactory” by preceptors on all evaluation criteria; all students passed the course.

Most students (62%) indicated that they completed four or more patient assessments per week as part of their clinic experience. Fifty-eight percent of students completed their clinic experience at a Patient Centered Medical Home (PCMH) site, while the rest spent time in clinic sites in oncology, psychiatry, anticoagulation, transitions of care (TOC), and a multispecialty practice. Seventy-six percent of students rotated through a site that utilized both clinic and phone visits (Table 1).

The median baseline score for seven of eight of the assessment questions was 3 (somewhat confident). There was a significant ($p < .001$) increase in scores for all questions pertaining to student confidence in their knowledge of ambulatory care pharmacy and their ability to contribute to patient care in the ambulatory care setting. Student interest in pursuing a career in ambulatory care did not change after exposure to the ambulatory care IPPE (Table 2). Given that some students completed the ambulatory care IPPE at clinic sites that only conducts phone visits, a post-hoc analysis of survey results was conducted comparing survey responses by type of clinic encounter (Table 3).

Student evaluations of preceptors were also assessed as part of the experience. Ninety-five percent of students strongly agreed or agreed that the preceptor helped them increase their understanding of ambulatory care practice and improve their skills. Ninety-one percent of students strongly agreed or agreed that their preceptor encouraged their self-directed learning and helped them to develop problem-solving skills in the ambulatory care environment. Ninety-seven percent of students strongly agreed or agreed that their preceptor was an enthusiastic and dedicated teacher. All students strongly agreed or agreed that their ambulatory care preceptor was a knowledgeable and respected professional.

All students provided written comments in the post-survey which aligned with common themes including an overwhelming appreciation for pharmacist interactions with patients in ambulatory care and a better understanding of chronic disease management. Students enjoyed the layered learning model when there were fourth-year students on rotation, reporting it gave them exposure to what APPE rotations would look like. Lastly, students appreciated being exposed to ambulatory care as many had never experienced this area of pharmacy. With regard to areas of improvement, the most common theme was the need for more time and the desire to see other areas of ambulatory care during the experience.

DISCUSSION

IPPE is designed to expose students to pharmacy practice in different settings, commonly inpatient and community, providing students with introductory experiences prior to APPE. IPPE structure varies greatly across pharmacy schools; expectations may also vary depending on the type of rotation site.

Our team created a required ambulatory care IPPE encompassing didactic, experiential, and interprofessional components. We studied the impact that the ambulatory care IPPE had on student confidence in their knowledge of ambulatory care pharmacy practice, their ability to contribute to patient care in ambulatory care settings, and their interest in pursuing a career in ambulatory care. Even with a relatively short time in clinic, survey results demonstrated a significant increase in confidence scores. The majority of students were involved in the assessment of four or more patients per week in the ambulatory care setting, reinforcing didactic components of our curriculum and providing valuable clinical experience prior to their fourth year ambulatory care APPE. The non-significant difference seen in student interest in pursuing a career in ambulatory care is likely due, in part, to the high baseline scores indicating strong initial interest in this area. Interestingly, although our experience was designed differently than that of Detra et al⁶ in that we included immersion time in clinic in addition to didactic content, we saw similar results. Student understanding of the role of ambulatory care pharmacists increased in both studies, with no difference in students intending to pursue a career in ambulatory care. Additionally, our study exposed all second-year students to direct patient care within ambulatory practice, while others have described ambulatory care experiences based on student preference and random assignment or elective courses.^{3,6}

There were a few limitations to our study, including the small sample size consisting of our first class of students who completed the experience. In addition, our students completed their ambulatory care IPPE in several different types of clinics, some of which were in less traditional ambulatory care settings. However, we believe this diversity of practice settings aligns with real-world ambulatory care practice and students consistently provided positive feedback on their experience and preceptors. Future studies should evaluate any association between the number of hours spent in ambulatory care clinic settings during IPPE and student learning, and whether there are differences as more care in the ambulatory setting shifts to telehealth. Additionally, the impact of completing an ambulatory care IPPE on ambulatory care APPE performance should be investigated.

CONCLUSION

Implementation of an ambulatory care IPPE significantly increased student confidence in their knowledge of ambulatory care pharmacy and confidence in their ability to contribute to patient care in the ambulatory care setting. While this experience did not have a significant impact on student interest in ambulatory care as a career option, baseline interest in pursuing a career in ambulatory care was high.

REFERENCES

1. Accreditation Council for Pharmacy Education. Accreditation Standards and Key Elements for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree. ("Standards 2016"). Released February 2015. Available at: <https://www.acpe-accredit.org/pdf/Standards2016FINAL.pdf>. Accessed October 11, 2019
2. Walker PC, Kinsey KS, Kraft MD et al. Improving student education and patient care through an innovative introductory practice experience. *Am J Health-Syst Pharm*. 2011;68(5):655-60.
3. Smith WJ, Bird ML, Vesta KS et al. Integration of an introductory pharmacy practice experience with an advanced pharmacy practice experience in adult internal medicine. *Am J Pharm Educ* 2012;76(3): Article S2.
4. Mort JR, Johnson TJ, Hedge DD. Impact of an introductory pharmacy practice experience on student performance in an advanced practice experience. *Am J Pharm Educ* 2010;74(1): Article 11.
5. Hardy YM, Marshall JL. "It's like rotations, but in the classroom": Creation of an innovative course to prepare students for advanced pharmacy practice experiences. *Curr Pharm Teach Learn*. 2017; 9:1129-1140.
6. Dettra J, Legari C, Karunathilake A, et al. Influence of an ambulatory care elective on career interest and perception of ambulatory care practice. *Curr Pharm Teach Learn*. 2018;10:382-388.
7. IPEC Interprofessional Education Collaborative. Interprofessional Collaborative Practice Competencies. Available at: <https://nebula.wsimg.com/923d6ff345809ba51e831ea3377fcedf?AccessKeyId=DC06780E69ED19E2B3A5&disposition=0&alloworigin=1>. Accessed July 14, 2020.

Table 1. Student Assignments by Clinical Focus of Ambulatory Care IPPE Site

| Ambulatory Care IPPE Site | Number of students (%)** |
|-------------------------------------|--------------------------|
| Patient Centered Medical Home | 50 (58.1) |
| Oncology Clinic | 13 (15.1) |
| Oncology Oral Chemotherapy Service* | 7 (8.1) |
| Psychiatry clinic* | 6 (7.0) |
| Transitions of Care* | 5 (5.8) |
| Multispecialty clinic | 3 (3.5) |
| Anticoagulation* | 2 (2.3) |

*Site completes phone visits only

**Total off by 0.1% due to rounding.

Table 2. Student Confidence in their Knowledge of Ambulatory Care Pharmacy, Ability to Contribute to Patient Care, and Career Interest (n=85)

| Student confidence in their: | Median | <i>p</i> value* | 1 Not at all Confident N (%) | 2 Marginally Confident N (%) | 3 Somewhat Confident N (%) | 4 Confident N (%) | 5 Very Confident N (%) | |
|--|--------|-----------------|--|--|--|--------------------------|---------------------------------------|-----------------|
| Ability to describe the role of the ambulatory care pharmacist on the ambulatory care team | | | | | | | | |
| Pre | 3 | <.001 | 4(4.7) | 18 (21.2) | 45 (52.9) | 16 (18.8) | 2 (2.4) | |
| Post | 4 | | 0 | 3 (3.5) | 7 (8.2) | 43 (50.6) | 32 (37.6) | |
| Ability to describe the role of the ambulatory care pharmacist in caring for patients | | | | | | | | |
| Pre | 3 | <.001 | 3 (3.5) | 19 (22.4) | 36 (42.4) | 23 (27.1) | 4 (4.7) | |
| Post | 4 | | 0 | 2 (2.4) | 10 (11.8) | 39 (45.9) | 34 (40.0) | |
| Ability to know where to obtain information in electronic health record to help care for patients | | | | | | | | |
| Pre | 3 | <.001 | 5 (5.9) | 20 (23.5) | 31 (36.5) | 22 (25.9) | 7 (8.2) | |
| Post | 4 | | 1 (1.2) | 1 (1.2) | 16 (18.8) | 39 (45.9) | 28 (32.9) | |
| Ability to find literature to help contribute to the care of patients in the ambulatory care setting | | | | | | | | |
| Pre | 3 | <.001 | 8 (9.4) | 17 (20.0) | 32 (37.6) | 23 (27.1) | 5 (5.9) | |
| Post | 4 | | 1 (1.2) | 6 (7.1) | 19 (22.4) | 36 (42.4) | 23 (27.1) | |
| Knowledge of the role of patient counseling in the ambulatory care setting | | | | | | | | |
| Pre | 3 | <.001 | 5 (5.9) | 12 (14.1) | 36 (42.4) | 27 (31.8) | 5 (5.9) | |
| Post | 4 | | 0 | 4 (4.7) | 6 (7.1) | 41 (48.2) | 34 (40.0) | |
| Knowledge of the role of motivational interviewing in the ambulatory care setting | | | | | | | | |
| Pre | 3 | <.001 | 3 (3.5) | 11 (12.9) | 33 (38.8) | 33 (38.8) | 5 (5.9) | |
| Post | 4 | | 0 | 8 (9.4) | 11 (12.9) | 33 (38.8) | 33 (38.8) | |
| Knowledge of how to apply the Pharmacist's Patient Care Process in the ambulatory care setting | | | | | | | | |
| Pre | 3 | <.001 | 6 (7.1) | 19 (22.4) | 38 (44.7) | 19 (22.4) | 3 (3.5) | |
| Post | 4 | | 1 (1.2) | 9 (10.6) | 9 (10.6) | 42 (49.4) | 24 (28.2) | |
| | | | 1 Not at all Interested N (%) | 2 Marginally Interested N (%) | 3 Moderately Interested N (%) | 4 Interested N (%) | 5 Extremely Interested N (%) | Unsure N (%) |
| Current level of interest in a career in ambulatory care pharmacy | | | | | | | | |
| Pre | 4 | 0.72 | 3 (3.5) | 3 (3.5) | 17 (20.0) | 39 (45.9) | 20 (23.5) | 3 (3.6) |
| Post | 4 | | 1 (1.2) | 8 (9.4) | 14 (16.5) | 32 (37.6) | 29 (34.1) | 1 (1.2) |

* Wilcoxon Signed Rank Test. **Some rows may not total exactly 100% due to rounding.

Table 3. Comparison of Survey Responses by Type of Clinic Encounters Completed
(Phone-Based Only vs. Phone and Clinic Visits)

| Student confidence in their: | Phone Group Pre-Post Comparison <i>p</i> value* | Phone and Clinic Group Comparison <i>p</i> value* |
|--|--|--|
| Ability to describe the role of the ambulatory care pharmacist on the ambulatory care team | .007 | <.001 |
| Ability to describe the role of the ambulatory care pharmacist in caring for patients | .03 | <.001 |
| Ability to know where to obtain information in electronic health record to help care for patients | .04 | <.001 |
| Ability to find literature to help contribute to the care of patients in the ambulatory care setting | .006 | <.001 |
| Knowledge of the role of patient counseling in the ambulatory care setting | .001 | <.001 |
| Knowledge of the role of motivational interviewing in the ambulatory care setting | .41 | <.001 |
| Knowledge of how to apply the Pharmacist's Patient Care Process in the ambulatory care setting | .03 | <.001 |
| Current level of interest in a career in ambulatory care pharmacy | .76 | .50 |

* Wilcoxon Signed Rank Test

Accepted Draft