

INSTRUCTIONAL DESIGN AND ASSESSMENT

An Advanced Pharmacy Practice Experience in Community Engagement

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Objective. To implement a 5-week advanced pharmacy practice experience (APPE) in community engagement and assess the impact of the APPE on students' confidence and ability to provide community-based services.

Design. Working with community partners, students provided medication reconciliation, attended interprofessional healthcare meetings, developed health-promotion activities, and conducted medication-therapy reviews.

Assessment. Responses to pre- and post-APPE 10-item surveys, preceptor and practice-experience evaluations, and the documented number of pharmacy student recommendations were determined.

Conclusion. This APPE provides students opportunities in nontraditional community settings to increase their confidence and enhance their skills in health-promotion activities, medication-therapy management, and interprofessional care of patients, all of which are essential to the practice of pharmacy.

Keywords: community engagement, community partners, medication therapy management (MTM), health promotion, geriatrics

INTRODUCTION

Developing community-engagement experiences for pharmacy students to learn and practice in nontraditional pharmacy-practice environments is important for cultivating culturally competent healthcare professionals, increasing access to health care, increasing student awareness of the unmet needs of underserved communities, and developing health-promotion services to address these needs.¹ Community engagement is considered "a public service which occurs in a reciprocal and mutually beneficial partnership between the university and the community."² Often universities can provide the expertise of faculty members and student manpower to address the challenges facing communities.³

The American Association of Colleges of Pharmacy (AACP) has addressed educational competencies and outcomes for community engagement. The educational outcomes of the 2004 Center for the Advancement of Pharmaceutical Education (CAPE) recommend that pharmacy school graduates be competent in health promotion and disease prevention in cooperation with patients,

communities, at-risk populations, and interprofessional healthcare teams.⁴ Additionally, the Report of the 2004-2005 Argus Commission recommends that pharmacy colleges and schools provide engagement opportunities that strengthen communities, especially in underserved areas.⁵

The 2006 AACP publication *Caring for the Underserved* recommends that pharmacy school curricula include evidence-based practice, clinical preventive services, health systems and health policy, community aspects of practice, and community services.⁶ Therefore, pharmacy students should be educated on health promotion, health literacy, cultural competency, and evidence-based recommendations for community preventive services. Descriptive reports in the pharmacy literature on advanced pharmacy practice experiences (APPEs) in public health, geriatric educational outreach, and wellness and disease prevention services demonstrate that pharmacy students have been provided with opportunities to practice medication-therapy management (MTM) in a variety of clinic or senior-community settings.⁷⁻⁹

Fourth-year doctor of pharmacy (PharmD) students have the clinical knowledge but may not have the experience, skills, or confidence to provide services to underserved communities. The community-engagement practice experience was developed to provide pharmacy students the opportunity to appreciate the value of their

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knowledge in the community and to develop confidence in their ability to educate patients. The reports and recommendations of AACP support the rationale for developing sites where pharmacy students can gain experience and develop their skills to address health promotion and disease prevention in underserved populations.

Creighton University pharmacy students are accustomed to participating in a variety of community-service opportunities during the first 3 years of the pharmacy program. A clinical APPE in community-health engagement aligns with the mission and core values of Creighton University: service to others, the inalienable worth of each individual, and appreciation of ethnic and cultural diversity. With the support of the administration, a clinical faculty position was fully funded by the university to coordinate and precept this practice experience. The objective of this study was to implement a 5-week APPE in community engagement and assess the impact of the experience on students' confidence and ability to provide community-based service.

DESIGN

The university's Institutional Review Board determined that oversight of this project was not required because it did not meet the definition for human-subject research. The practice-experience learning objectives were developed based on CAPE outcomes as well as educational outcomes for the pharmacy program. Several tools, such as medication history, medication action plan, and pharmacist recommendation forms were created by the preceptor for student use. Medication history forms were used to gather data necessary to formulate medication recommendations. Students provided their MTM recommendations to patients and/or nurses on medication action-plan forms. All MTM recommendations were reviewed and approved by the preceptor prior to distribution to patients and/or nurses. Students were also required to complete weekly pharmacist-intervention forms detailing their MTM recommendations, which were submitted to the preceptor. Required readings were chosen to supplement the students' learning, and weekly quizzes were given to verify student compliance with reading assignments. During clinical activities, students were supervised by either the faculty preceptor or home-care nurses, and several times each week, the faculty preceptor met with students to review their pharmacy recommendations, medication action plans, and health-promotion projects.

Initially, the faculty preceptor collaborated with 1 community partner, a nonprofit home-care agency. However, over a 4-year period, faculty members networking in local nonprofit agencies resulted in expansion to 23 community partners (Table 1). The faculty preceptor's

Table 1. Community Partners and Sites Associated With an Advanced Pharmacy Practice Experience

Community Partner	No. of Sites
Area Office on Aging Senior Centers	7
Area Office on Aging <i>Senior Companions</i> and <i>Foster Grandparents Program</i>	2
Parochial inner-city schools	2
Church-affiliated food bank	1
Church-affiliated medical clinic	1
Active aging wellness program	2
Salvation Army	1
Senior living communities – independent, assisted living, and long-term care	5
Visiting Nurse Association	1
Local Chapter of the National Safety Council	1
LiveWise Coalition	1
Catholic Charities Addiction Recovery Center	1

role was to mentor the students in meeting the needs of the community partners and coordinate student and community-partner schedules while continuing to network, develop, and sustain community-partner relationships. For the relationship to be mutually beneficial, the community partners had to communicate the educational needs of their clients and ensure client participation in the health-promotion activities.

Students were required to participate in a variety of clinical activities and health-promotion projects. Because the practice experience involved multiple community partners, students were given an electronic calendar outlining the required activities on the first day of the APPE. A sample of students' weekly schedules is presented in Table 2. Practice-experience activities include: medication review and reconciliation, patient counseling, development of medication-action plans, interprofessional team meetings, health screenings, health-education programs, and health-promotion activities. Health education programs presented to seniors included Medication Management and Fall Prevention, Spring Cleaning Your Medicine Cabinet and Medicine Disposal, and Immunizations for Seniors. Health-literacy modules created for elementary-school children included topics such as Healthy Bones, Fast Food Healthy Choices, and Poison Prevention.

EVALUATION AND ASSESSMENT

Assessment of the APPE included pre- and post-APPE 10-item student survey instruments, preceptor evaluations, and practice-experience evaluations. The preceptor collected the students' MTM recommendations from the beginning of the practice experience, and

Table 2. Example of Students' Weekly Schedule of Practice-Experience Activities

	Monday	Tuesday	Wednesday	Thursday	Friday
Morning	Addiction recovery center - medication reviews and group sessions	Medication reviews at rehabilitation facility	Medical clinic	Homecare visits with Home health agency	Medication review clinic at senior living community
Midday	Meet with preceptor	Meet with preceptor	Meet with preceptor		Meet with preceptor
Afternoon	Health presentation at senior nutrition center	Interdisciplinary team meeting at long-term care facility	Health literacy program at elementary school		Osteoporosis screening at senior living community

students completed reflection questions at the end of the APPE.

Forty-three PharmD students completed the practice experience from February 2007 through March 2011. Students were required to complete a 10-item survey instrument on the first day of the practice experience before orientation with the preceptor and also on the last day of the practice experience. The faculty preceptor developed the survey instrument based on the practice-experience objectives. The survey instrument served as an assessment of students' perceptions of their own competence and confidence related to the skills necessary for providing

pharmacy services to patients in community-based programs. Each statement was measured using a 5-point Likert scale on which 1 = strongly disagree and 5 = strongly agree. To compare the score differences between the 2 dependent groups with ordinal data, a non-parametric Wilcoxon signed rank test was conducted, the results of which indicated that students' confidence improved in every survey item following the practice experience (Table 3).

Each Creighton University APPE preceptor is evaluated at the end of the practice experiences with a programmatic evaluation. The items on this evaluation used

Table 3. Comparison of Students' Pre- and Post-Advanced Pharmacy Practice Experience Scores (N = 42^a)

Survey Item	Mean Score (SD) ^b		P ^c
	Pre-APPE	Post-APPE	
I am confident in my clinical skills to evaluate drug regimens for medication-related problems.	3.9 (0.5)	4.3 (0.5)	<0.01
I am confident in my clinical skills to resolve medication-related problems.	3.8 (0.6)	4.4 (0.5)	<0.01
I am confident in my ability to effectively conduct patient interviews in a community-based program.	3.9 (0.6)	4.7 (0.5)	<0.01
I am confident in formulating appropriate care plans for patients/clients in a community-based outreach program.	3.4 (0.7)	4.4 (0.5)	<0.01
I am confident in my ability to collaborate with agency staff, other healthcare providers, and client/family to manage medication-related problems to optimize client outcomes.	3.8 (0.6)	4.5 (0.5)	<0.01
I have the clinical skills needed to resolve physical, psychological and economical barriers to medication compliance for clients.	3.4 (0.7)	4.2 (0.6)	<0.01
I am able to effectively assist in the development of community health outreach initiatives (ie, immunization education, health literacy, disease prevention, and promotion programs).	3.6 (0.7)	4.4 (0.6)	<0.01
I am capable of delivering educational programs to the community regarding medications, medication usage, health promotion, and disease prevention.	3.8 (0.7)	4.6 (0.5)	<0.01
I am able to demonstrate sensitivity to patients of differing age, race, socioeconomic status, values, cultural background, or disability.	4.3 (0.6)	4.6 (0.5)	<0.01
I am able to demonstrate a Jesuit core value, <i>cura personalis</i> (care of the person), in my day-to-day clinical pharmacist responsibilities.	4.2 (0.7)	4.7 (0.5)	<0.01

^a 1 student did not complete the post-APPE survey.

^b Rating scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

^c Wilcoxon Signed Rank-Test

Table 4. Responses to Preceptor and Practice-Experience Items on a Survey Evaluation of Pharmacy Students Completing an Advanced Pharmacy Practice Experience^a in Community Engagement (N = 24)

	Responses by Rating, No. ^b					Score, Mean (SD)
	4	3	2	1	NA	
The preceptor encouraged students to actively participate in discussions.	19	5	0	0	0	3.8 (0.4)
The preceptor provided feedback, which identified both strengths/proficiency and weakness/deficits throughout the rotation.	16	6	1	0	0	3.7 (0.6)
The preceptor encouraged problem-solving and professional decision-making with supervision.	16	8	0	0	0	3.7 (0.5)
The preceptor demonstrated effective and appropriate interpersonal skills.	20	4	0	0	0	3.8 (0.4)
The preceptor modeled problem-solving strategies.	17	6	1	0	0	3.7 (0.6)
The preceptor served as a positive role model.	21	3	0	0	0	3.9 (0.3)
The rotation allowed the student to apply knowledge to actual patients.	18	5	0	0	1	3.8 (0.4)
The rotation allowed the student to communicate with other health professionals.	17	7	0	0	0	3.7 (0.5)
The rotation allowed the student to assess patients and recognize problems.	17	7	0	0	0	3.7 (0.5)
The rotation allowed the student to develop written communication and documentation skills.	17	7	0	0	0	3.7 (0.5)
The rotation allowed the student to provide patient education/counseling.	18	6	0	0	0	3.8 (0.4)
The rotation allowed the student to monitor drug therapy for efficacy, adverse effects, and compliance.	14	9	0	0	1	3.6 (0.5)
This experience will help students be better pharmacists.	16	8	0	0	0	3.7 (0.5)

^a Advanced pharmacy practice experience referred to in the survey as rotation.

^b Rating scale: 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree.

a 4-point Likert scale on which 1 = strongly disagree and 4 = strongly agree. Selected items from the 2008-2010 evaluations are listed in Table 4. Between January 2007 and April 2010, pharmacy students reviewed medication regimens for 566 seniors and provided 1,905 medication-therapy recommendations. A summary of these MTM recommendations is provided in Table 5. There were also 171 recommendations for medication-related issues, such as medication adherence, clarification of medication dose, patient counseling, immunization requests, medication cost, and patient diagnoses identified but not currently being treated. Examples of requests for additional

medications included calcium and vitamin D for older female patients at risk for osteoporosis, aspirin for patients with coronary artery disease, and lipid-lowering agents or angiotensin-converting enzyme-inhibitor medications for diabetic patients. Therapeutic-substitution recommendations were often related to detection of patients taking potentially inappropriate medications, as identified on the Beers Criteria for Potentially Inappropriate Medication Use in Older Adults.¹⁰

Students provided medication action plans for home-health nurses to review with primary care providers. They also prepared medication action plans for patients seen in medication review clinics and asked the patients to take the plans to their next medical appointments to review with their healthcare providers. However, not all of the recommendations required primary care-provider involvement; for instance, patients may have been advised during their clinic visit regarding the optimal time for medication administration.

In an effort to capture feedback that was not part of the programmatic APPE evaluation and to better discern whether the preceptor and practice experience met the objective of “caring for the person” during this 5-week experience, students were required to respond to reflective questions at the end of the practice experience.

Students indicated that they enjoyed interacting with nurses, physical therapists, and occupational therapists and learning how much care patients need following

Table 5. Number of Clinical Requests and Recommendations Made by Advanced Pharmacy Practice Experience Students

Requests and Recommendations	No.
Laboratory requests	439
Requests for additional medications	232
Requests for alternative medication	185
Requests to discontinue a medication	118
Requests to decrease a medication dose	86
Requests to increase a medication dose	87
Drug interactions identified	433
Potential side effects noted	221
Drug duplications identified	36
Dose-scheduling adjustments	68
Medications without a diagnosis or indication identified	58

dismissal from the hospital. As a result of their community experience, they recognized that working behind a pharmacy counter does not provide an accurate picture of healthcare beyond the pharmacy. Students also reported that patients' reliance on them for answers to medication questions made them feel valued and as though they had a voice in the community as "drug experts."

DISCUSSION

The 5-week APPE resulted in a significant increase in students' competence and confidence in the skills necessary for providing pharmacy services to patients in community-based programs. Significance was achieved for all survey items. Presurvey data for items 9 and 10 (Table 3) indicated that students already had confidence in their ability to demonstrate cultural sensitivity and *cura personalis* (care of the person), which would be expected of students in the pharmacy program because of required service-learning and reflection in the classroom portion of the curriculum. However, there was still a significant increase in their confidence by the conclusion of the APPE.

The greatest change in pre- and post-APPE scores occurred with 2 items. Specifically, there was an increase in students' perceived confidence in formulating appropriate care plans for patients in community-based outreach programs (item 4) and their skill in delivering educational programs to the community (item 8). The authors attribute the change in the students' perceived confidence to perform these skills to the activities required of them during the practice experience.

The programmatic APPE evaluation was revised in 2007; therefore, only data from 2008 to 2010 are presented in Table 4. Students either agreed or strongly agreed that the preceptor and practice experience fulfilled 9 of the 13 evaluation items. It is unknown why there was a "not applicable" response to 2 survey items related to applying knowledge and skills in the community setting (items 7 and 12), considering that the majority of the practice experience required student participation in MTM for actual community-based patients.

Although the community partners expressed sincere appreciation for the pharmacy services provided by students during the APPE, thus far, the preceptor has been unable to develop a method for documenting the number of MTM recommendations implemented, which is certainly a limitation of the data collection process. The difficulty in tracking the acceptance and implementation of MTM recommendations can be attributed to the number of community partners, the diverse healthcare environments, and the varied methods of delivering MTM recommendations. A potential resolution is for students to duplicate each medication action plan so that the original

can be given to the patient or nurse and a copy that includes responses to the recommendation(s) can be returned to the preceptor. In the future, the preceptor may require students to follow-up on responses to recommendations as part of their APPE final grade.

Because the practice experience was first implemented in 2007, the preceptor has collected extensive reflection data, which have been used to consider how future practice experiences could be enhanced. The data are also valuable as a quality-assurance measure when evaluating the community partner's vested interest in the programs offered. The authors believe that additional information could be gleaned from a theme analysis of future reflection data. Although anecdotal evidence from community partners is currently used to maintain and develop the community partnership and engagement activities, use of a formal, annual evaluation by the community partners is being considered.

This 5-week APPE has been successful as an elective practice experience. Other pharmacy programs could implement a similar APPE into their curricula if funding were available for a faculty position, as this is an important component for the success of the APPE. Although the community partners provide a rich learning environment for pharmacy students, they do not have the funding to support a pharmacy faculty salary. Residency directors might also consider adding a community-engagement practice experience to residency programs, which would provide support for outreach programs of the hospital.

An opportunity exists for pharmacy faculty members to participate in health-promotion activities in an effort to foster community engagement. Within Creighton University School of Pharmacy and Health Professions, community partnerships have expanded because our partners endorse our health-promotion programs to other non-profit agencies. The community partners appreciate the medication reviews and health-promotion activities provided to the patients they serve as well as the social interaction these activities offer their clients and our students. In their interactions with patients, students must use skills such as communication, clinical assessment, critical thinking, and empathy to develop patient-appropriate recommendations.

SUMMARY

A 5-week community-engagement APPE provided a unique opportunity for students to participate in clinical pharmacy services as well as health-promotion activities to improve the health of residents in the community. Students' competence and confidence in performing the skills necessary for providing pharmacy services to patients in community-based programs increased significantly. The

practice experience offered students opportunities to develop health-promotion programs, work with an interprofessional team, and collaborate with community partners. The authors are optimistic this experience will inspire students to participate in community-based programs as licensed pharmacists.

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