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Maryam Noureldin

Purdue University, maryamnoureldin93@gmail.com

Chelsea M. Anderson

Purdue University Center for Medication Safety and Advancement, canderson@purdue.edu

Patricia L. Darbshire

Purdue University, darbishi@purdue.edu

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A COURSE ON PATIENT SAFETY:

Pharmacy Student and Community Partner Perceptions

Maryam Noureldin, PharmD; Chelsea M. Anderson;
and Patricia L. Darbshire, PharmD; *College of Pharmacy*

ABSTRACT

The authors of this article developed and piloted a three-week intensive elective course for students in their third professional years in the Doctor of Pharmacy program. The goal of this course was to provide students with an opportunity to apply patient safety concepts in a real-world setting using service-learning as the pedagogy and to evaluate student perceptions of the course for potential implementation in the curriculum. Seven pharmacy students were enrolled in the pilot course and divided into three groups. Each group of two to three students was assigned to one of three predetermined community partner sites. Students were instructed on how to perform a needs assessment before designing a project targeted to improve safety at their community sites. Students completed a pre-, retrospective pre-, and post-course questionnaire that assessed their perceptions of the course. Community partners provided feedback to their student groups, and the results were analyzed to determine whether a large-scale course should be developed for the curriculum. Ultimately, results from this pilot course suggest that offering pharmacy-based, service-learning experiences in safety may be beneficial for the professional development of the students, as well as for the local community.

KEYWORDS

service-learning, patient safety, medication safety, pharmacy, community, public health

INTRODUCTION AND BACKGROUND

Patient safety and safe medication processes are the foundation of pharmacy practice. The Accreditation Council for Pharmacy Education accreditation standards and guidelines for the Doctor of Pharmacy Program emphasize the importance of teaching safety principles in the pharmacy curriculum to ensure optimal patient outcomes (ACPE, 2015). Pharmacists must employ evidence-based practices, promote quality improvement, utilize informatics, and demonstrate competency in their ability to work with others. The Center for the Advancement of Pharmacy Education (CAPE) says the role of the pharmacist is to manage and impact resources in order to ensure the safety and efficacy of medication use systems (Medina et al., 2013).

Pharmacy students learn safety topics through a variety of didactic, simulated, and experiential components within the Doctor of Pharmacy curricula. Patient Safety and Informatics (PHRM 86800) is a core course that focuses on principles of safe medication use practice. It provides a didactic foundation for the application of safety concepts and incorporates simulated activities. In order for students to apply these principles in a real-world setting, a new, one-credit-hour elective course (5 hours per week for 3 weeks) was piloted in the spring of 2017. This course, called “Safety and Service Learning” (PHRM 49000), provided student groups with an

Figure 1 (banner image, above). Purdue University Pharmacy. (Source: <https://news.uns.purdue.edu/images/2015/pt-retail-pharmacy.jpg>.)

opportunity to conduct a formal needs assessment and design a project intended to improve safety within a community organization.

Service-learning was the ideal framework in which to conduct this course, as it enhances students' sense of personal values and civic responsibility. This pedagogy incorporates discussion and reflection, which extends understanding and appreciation of course content (Cress, Collier, & Reitenauer, 2013; Jacoby, 2015). Research has shown that service-learning courses can notably improve pharmacy students' cultural competency skills, professional communication, and overall awareness of the diversity of community service agencies (Kearney, 2013). These service-learning experiences are different from pharmacy practice experiences (PPEs) or rotations, which are a requirement in each year of the professional pharmacy program. PPEs are practice-based experiences with an emphasis on patient care that integrate, apply, reinforce, and advance the knowledge, skills, attitudes, abilities, and behaviors developed throughout the curriculum (ACPE, 2015). The service-learning experience seeks a balance between enhancing student learning of discipline-specific knowledge and addressing real community needs, whereas the PPEs provide hands-on clinical and other practice experiences. The objective of this study was to evaluate student and community partner perceptions of the service-learning pilot experience for potential implementation in the curriculum.

METHODOLOGY

Class Structure

This pilot course was designed and supported through the Purdue Service-Learning Faculty Grant Program—a program developed to expand and institutionalize service-learning into the academic fabric of Purdue University. Purdue faculty who demonstrate potential for creating innovative, high-impact, transformational learning experiences for students are eligible for this grant (Center for Instructional Excellence, n.d.).

The student objectives for the course included engaging with a community partner to conduct a safety needs assessment, applying didactic safety concepts in the development of a service-learning project, and presenting a project idea to peers and instructors. They also included providing feedback on peer projects and reflecting on the experience both verbally and in writing. Students were encouraged to explore grant writing or publication opportunities upon finalizing their safety-targeted project plan.

The course instructors contacted community partner sites to determine their interest in participating in this course. Three sites were selected prior to the beginning of the course, which included an independent pharmacy (Figure 1), a community center (Figure 2), and a chain pharmacy (Figure 3). Student teams were assigned to one of the three participating sites the first week of class. Students were allowed to switch among groups and/or community partners, but none chose to deviate from the original assignments.

Class time was dedicated to group work and meeting with community partners. Students were introduced to topics such as the meaning of service-learning and how to conduct a community needs assessment. They were also provided with information about funding opportunities, such as the Community Service/Service-Learning Student Grant Program, facilitated by Purdue's Office of Engagement. The University funds projects and services that encourage students to help solve community-based problems or provide services that utilize their education and expertise. Grants range from \$100 to \$500 for an individual or up to \$1,500 for a team of students (Office of Engagement, n.d.a, n.d.b). Opportunities to disseminate their work were also discussed, including poster and podium presentations and publications. The *Purdue Journal of Service-Learning and International Engagement* is one such opportunity to submit a student-authored article about a community-based project. The journal highlights student engagement with local, state, national, and international communities (PJSL, n.d.). Students were required to discuss a plan for funding or project dissemination during their final project presentation to the class. Student groups then presented their project ideas to the community partner. Feedback from community partners was collected on a standardized form, signed by the community partner, and returned to the course coordinator.

The course was graded as A (90% or above) through F (below 70%). Graded elements included class attendance and active participation (30%), community partner needs assessment (15%), formal presentation of needs assessment and potential project ideas (10%), feedback provided to other groups (10%), presentation of project design to community partner (10%), and a final group presentation to class (25%).

Questionnaire

Three surveys—a pre-, retrospective pre-, and post-course questionnaire—were formulated by the course

instructors and based on the overall course objectives. These questionnaires were administered using Qualtrics software to the seven students to evaluate their expectations, perceptions of the course, and overall experience with the community partners and their projects. The course instructors elected to use the pre- and retrospective pre-post questionnaire format, as it has been demonstrated to more accurately reflect a true degree of change in knowledge or attitude after examination of both responses. Providing basic knowledge or a framework for the topic often results in differences between the pre- and retrospective pre-course attitudes of the students (Rockwell & Kohn, 1989).

Students received a link to complete the pre-course questionnaire prior to the first class. They then received a link to the retrospective pre- and post-course questionnaires three weeks later, at the conclusion of the course. The survey consisted of open-ended questions as well as those that utilized a Likert scale, with 1 indicating “strongly disagree” and 5 indicating “strongly agree” (see Table 2). All students received the same version of the three questionnaires.

Descriptive statistics were calculated using paired samples t-tests on IBM SPSS software. Student and community partner comments were examined and reported. This study was reviewed by the Purdue University Institutional Review Board (IRB) and granted exempt research approval.

RESULTS

Demographics

Student participants’ demographics are described in Table 1.

Table 1. Course demographics (n = 7).

| | |
|--|---------------|
| Male Gender | 71.4% (n = 5) |
| Age: Mean (SD) | 25.3 (3.1) |
| No previous participation in a service-learning course | 71.4% (n = 5) |

Students’ primary motivations for enrolling in the course are reflected in the following student comments.

- “I want to take a hands-on course that will facilitate my learning significantly better than a lecture course.”
- “I want to learn how to benefit my community through effective methods so I can continue providing these benefits to communities in which I will live.”

- “I am interested in service to my community, as well as how to develop my medication safety skills.”
- “I would like to understand the processes involved in service-learning, and how to apply them to my future practice in pharmacy.”

Service Project Sites

The student teams designed three safety projects for future implementation in the local community at three different sites: Hartford Hub, Walgreens Pharmacy, and Purdue University Pharmacy.

Hartford Hub

Hartford Hub (Figure 2) is a local community center financed by Faith Ministries in Lafayette that provides after-school care and activities to a low-income neighborhood. To aid in promoting community safety, the student team developed a plan to implement biweekly, after-school educational lessons focusing on nutritional education and substance abuse prevention for grade school children. This will involve a partnership with College of Pharmacy student organizations.



Figure 2. Hartford Hub Community Center in Lafayette, Indiana. (Source: <http://www.faithlafayette.org>.)

Walgreens Pharmacy

Walgreens is a national retail pharmacy chain. This student team worked within a Well Experience™ store, where the pharmacist is seated outside the prescription processing area to improve patient accessibility (Figure 2). The student group focused on ways to improve how pharmacy staff communicates product manufacturing changes to patrons picking up prescriptions, such as highlighting a product change on the prescription leaflet. Through this enhanced method of communication, patrons would be more aware of medication interchanges.



Figure 3. A Well Experience Walgreens Pharmacy. (Source: Walgreens Pharmacy.)

Purdue University Pharmacy

Purdue University Pharmacy (Figure 1) is a university-based, independent pharmacy with a two-fold mission: (1) to provide prescription services to students, faculty, staff, retirees, and dependents; and (2) to provide pharmacy students with instruction and experience in a community pharmacy setting. The student group developed a plan and implementation strategy for a tuberculosis medication distribution system. This system would ensure that patients receive the best treatment, minimize dispensing errors, and increase cure rates and safety for this patient population.

Questionnaire

The post-course assessment revealed that a majority of the students (86%) agreed or strongly agreed that they learned valuable information from the course. A comparative analysis of the pre- and post-course questionnaire results demonstrated:

- a statistically significant increase in an understanding of the concept of service-learning ($p < 0.01$),
- the ability to conduct a needs assessment ($p < 0.01$),
- the ability to strategically develop a service-learning project ($p < 0.01$), and
- the likelihood to pursue a presentation ($p = 0.02$), publication ($p < 0.01$), or grant-writing ($p < 0.01$) opportunities.

The comparative retrospective pre-course and post-course analysis yielded the same statistically significant increases with the addition of enhanced confidence in professional writing skills ($p < 0.05$) (Table 2).

STUDENT IMPACT AND REFLECTION

Students were required to reflect both verbally to their peers and instructors and in writing on the impact of the experience to themselves and the community. Below are select student responses when asked to “describe the importance of using your knowledge/skills to benefit your community.”

- “It gives us a sense of compassion.”
- “It betters our community and improves the lives of our patients.”
- “It helps the community better understand their health and pharmacy, while allowing me to build on my professionalism as a practicing pharmacist. Ultimately, it makes me a better pharmacist so I continue benefitting my community.”
- “Pharmacists are leaders in any community. Patients are comfortable with their pharmacist and look up to them. Giving back to the community is a way to build and demonstrate strong character, and provides a good example for others.
- “Being a part of the community in which you live enhances trust in us as professionals.”

As evidenced above, students reflected positively on the opportunity to serve their community using their pharmacy knowledge and skills. Their responses touched upon the principle of reciprocity whereby both the community and the students gain from service-learning projects. The students received hands-on experience working in their communities and were able to apply material covered in their curriculum. They found value in learning about opportunities to present or publish their work and talked about how it enhanced their professional development. The community partners provided both verbal and written feedback to the student groups during the project design. Students noted the importance of receiving real-life feedback on their work and having the opportunity to change their design based on the community partners’ concerns. Listening to and addressing issues is an important pharmacy-based skill. Along with feedback from their community partners, students gained experience delivering feedback to other groups during class presentations, as well as utilizing this feedback to improve their own projects.

At the end of the course, student groups expressed interested in following up with their community partners for implementation of the project, grant, and/or scholarship

Table 2. Students' agreement with questionnaire statements.^a

| | Pretest Mean (SD) | Retrospective Pretest Mean (SD) | Post-Test Mean (SD) |
|--|-------------------|---------------------------------|---------------------|
| I know what the term “service-learning” means. ^{b, c} | 3.43 (0.78) | 3.29 (0.79) | 4.71 (0.49) |
| I know how to conduct a community needs assessment. ^{b, c} | 1.86 (0.69) | 1.71 (0.49) | 3.71 (0.49) |
| I know how to strategically plan a service-learning project. ^{b, c} | 1.71 (0.49) | 1.86 (0.69) | 4.28 (0.76) |
| I am confident in my professional verbal communication skills. | 3.14 (0.90) | 3.14 (0.69) | 4.00 (0.82) |
| I am confident in my professional writing skills. ^c | 3.00 (1.15) | 2.57 (1.13) | 3.57 (0.98) |
| I am confident providing formal feedback to peers. | 3.71 (0.49) | 4.00 (0.00) | 3.86 (0.69) |
| I have seriously explored a presentation opportunity (e.g., a state or national poster presentation) not required by a course. ^{b, c} | 2.43 (1.27) | 2.14 (0.90) | 4.43 (0.79) |
| I have seriously explored article publication opportunities. ^{b, c} | 2.29 (0.76) | 1.86 (0.69) | 4.57 (0.53) |
| I have seriously explored grant-writing opportunities. ^{b, c} | 2.14 (1.07) | 1.71 (0.49) | 3.86 (1.21) |

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

^b Pre-course vs. post-course, *p* < 0.05

^c Retrospective pre-course vs. post-course, *p* < 0.05

opportunities. The following are examples of student feedback provided to the instructors.

- “The course content was not like any other we received in the curriculum. It was a way of implementing ideas that we had learned.”
- “I liked the flexibility given to students in regard to selecting projects they are passionate about.”
- “The hands-on approach to helping a community address their needs, writing for grants, and publishing in a journal are what I liked most about the course content.”
- “I liked how hands-on it was and how the focus was on understanding processes that we could apply in the future.”

COMMUNITY IMPACT AND REFLECTION

An integral part of each project was conducting a needs assessment for community partners. Student teams generated a list of questions to ask the site’s staff to better understand the needs of the organization and then presented these to the entire group for feedback. As this was a safety-focused elective, most questions pertained to

safety of patients at and/or patrons of their organizations. An example question is, “If you had unlimited resources, what would you do differently at your worksite to improve safety?” Most staff members had never been asked this question before, but everyone had thoughts on how to improve their processes.

Immediately following the presentation of the project, each community partner site was asked to give the following feedback in writing to the students regarding their ideas.

- Specific questions they had about the project idea(s):
 - “In regard to the survey you plan to implement to my patrons, would you consider moving it from 30 days post-implementation to 90 days to give the patrons time to adjust to the change?”
 - “I’m not sure how to measure success with this project?”
- What they liked most about the project idea(s) and why:
 - “Your idea about implementing daily unit dose packaging is so relevant and will solve a need

we currently have. We will also consider hiring a student instead of a technician.”

- “You gave us an idea that we can implement at store level instead of corporate, while still being open to the option of involving corporate for a larger change.”
- Anything they might want to change about the project idea and why:
 - “Could you shift the workload away from manual work to eliminate the human error and focus your idea more on the computer technology?”
 - “Could you focus more on drug education and strengthening the volunteer base?”

Community partners seemed to become more aware and sensitive to significant safety issues within their organization as a result of being asked to verbalize concerns. They were overwhelmingly positively regarding the project ideas and had input into the topics from the start. They also noted an appreciation for the opportunity to work with Purdue students and find potential solutions to their needs.

The primary barriers for sites were identified as staff time and funding for resources. However, one unique barrier encountered by the team working with the national retail chain, Walgreens, was the issue of implementing change on a corporate level. At the end of the course, all constituents agreed that students needed more time to implement real changes at the sites, more time to document positive outcomes from the safety projects, and further guidance on funding and scholarship opportunities.

STUDENT AUTHOR IMPACT

An integral component of pharmacy practice is improving the health of our patients by serving within our community. As such, it felt natural to instruct a service-learning course that aligned with a pharmacy curriculum. Having participated in service-learning activities before, the instructors were able to express the benefits to service-learning and encourage the students to continue to seek out service-learning opportunities in the future.

Areas for improvement, reported by students, included adding more options for pharmacy sites, expanding the class size but limiting it to 20 students, lengthening the course to 8–16 weeks, increasing the course credit hours so it is more reflective of the amount of work required, and more discussions on applying for grants and manuscript writing. This feedback is helpful when considering the design of a new course.

As instructors, we reflected on ways to improve the course. These included changes to our needs assessment presentation, a rubric for grading handouts and presentation style, a requirement for professional dress during the final formal presentation, a peer assessment for individual groups, and structured time for students to work on grant-funding applications. We also discussed the importance of limiting the class size to maintain the quality of instructor mentoring and project feedback.

CONCLUSION

Results from this pilot course suggest that offering pharmacy-based, service-learning experiences in safety may be beneficial for the professional development of the students, as well to the local community. Positive responses from both students and community partners are incentive to create service-learning-based courses for pharmacy students. Based on the perceived value this course offers, instructors will explore the opportunity to offer the course as part of the core curriculum.

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STUDENT AUTHOR BIO SKETCH

Dr. Maryam Noureldin is a 2016 graduate of the Purdue College of Pharmacy. She is currently pursuing postgraduate education as a pharmacy practice resident at Franciscan Health in Lafayette, Indiana. In January of 2017, as part of her residency program, she assisted **Dr. Patricia L. Darbshire**, a pharmacy practice faculty member, and **Dr. Chelsea M. Anderson**, a project manager from the Center for Medication Safety Advancement, in the design and implementation of a new service-learning pilot course called “Safety and Service Learning.” Dr. Noureldin has

been involved with other safety-focused service-learning projects and research, including unused medication collection research. Her career aspirations include academia and pharmacy research focusing on improving patient safety.

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