Research Article

Strengthening Pharmacy Students' Knowledge in Patient Care through Community-based Outreach Activities

Wiwat Thavornwattanayong* and Nattiya Kapol

Department of Community Pharmacy, Faculty of Pharmacy,
Silpakorn University, Nakhon Pathom, Thailand
**Correspondence author. Email address: Thavornwattanay_w@su.ac.th, ajwiwat@gmail.com*

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Abstract

This quasi-experimental study aimed to design and compare outcomes of two early experiential activities through community-based learning. Seventy pharmacy students were assigned into an intervention and control group to practice at certain communities. The program in the intervention group included a 1-day brief lecture on a basic physical examination and patient interview techniques and a 10-day program of four health-related activities; home visits, health screening, health education, and case discussion. The control group practiced a 10-day routine activity of the community. The students' knowledge and attitude, the pharmacist and the practitioners' attitude were assessed at the end of the program. The findings revealed that both groups showed improvement in total knowledge scores but basic health care score was significantly higher in the intervention group than in the control group ($p<0.01$). All students were satisfied with the program and responded that their knowledge was strengthened. From the pharmacists' viewpoint, patient care experience encouraged students to take care of others and the program helped students to understand health and drug use problems in the community. To sum up, the program was able to strengthen the patient care knowledge of students and health concern of the community. These benefits will encourage both students and communities to further solve health problems.

***Key Words*:** Community-based outreach activities; Patient care; Pharmacy student; Knowledge; Attitude

Introduction

Pharmacy education in Thailand was totally changed from the 5-year bachelor degree program to a 6-year doctor of pharmacy (PharmD) degree program in 2009. The pharmacy curricula have been moving towards a more patient-oriented content. For the patient-oriented area, providing patient care skills is a pivotal professional competency for new pharmacy graduates (Kassam and Volume-Smith, 2003; Maitreemit et al., 2008). Patient care is a required competency for pharmacy graduates not only in Thailand, but also in several countries (Accreditation Council for Pharmacy Education, 2006; National Association of Pharmacy Regulatory Authorities, 2007; Maitreemit et al., 2008; Ryan et al., 2008; FIP Pharmacy Education Taskforce, 2010; Pharmaceutical Society of Australia, 2010; Singapore Pharmacy Council, 2011). Therefore, the integration of patient care skills in the pharmacy education program is crucial (Kassam and Volume-Smith, 2003)

Pharmacists are patient care providers and the effects of providing patient care by pharmacists promotes therapeutic, safety and humanistic outcomes (Chisholm-Burns, 2010). In order to enhance patient care experiences, pharmacy schools have endeavored to develop curricula and teaching strategies for their students. Patient care skills can be integrated into several courses especially professional practice experience that will greatly provide the improvement of students' competency (Kassam et al., 2008; Jungnickel et al., 2009, Pan American Conference on Pharmacuetical Education (CPEF), 2014). Likely, the Accreditation Council for Pharmacy Education (ACPE) and Pan American Conference on Pharmaceutical

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Education (CPEF) requires experiential education in pharmacy schools as an important course to support the achievement of pharmacy competency (Accreditation Council for Pharmacy Education, CPEF, 2014).

Developing patient care competency has been implemented in various pharmacy schools in the United States. To strengthen the students' understanding in patient care concept, primary health care approach was applied. For example, McGivney (2009) proposed a model of a faculty-practice site partnership in advanced professional practice to provide patient care experience for the students. Patterson (2008) implemented an advanced professional practice at the University of Missouri-Kansas City School of Pharmacy to provide students with public health concepts applicable in pharmaceutical care. Vrahnos and Maddux (1998) developed an introductory professional experience course at the St. Louis College of Pharmacy to introduce the first and second year students to clinical practices and writing. Recently CPEF, Forum of the Americas (FFA), The International Pharmaceutical Federation (FIP), and Pan American Health Organization (PAHO)/ World Health Organization (WHO) have proposed a guideline and have supported pharmacy schools to include a term of "Primary Health Care (PHC)" in their curricula. To achieve students' understanding of health system concept we need not only to include patient care but also PHC. Therefore, pharmacy schools in several countries have designed the experiential education with PHC concept allowing pharmacy students to engage in pharmacy practice settings; hospitals and health-system pharmacies.

In Thailand, experiential education accounts for 2,000 practice hours. The introductory 400 practice hours take effect at the end of the fourth year (year 4 of 6-year program), and the other 1,600 practice hours are provided to the fifth to sixth year students. For the introductory experiential education, students learn compulsory practiced professional skills from preceptors in hospital and drugstore settings (Pongcharoensuk and Prakongpan, 2012). Like other universities in Thailand, the course "Professional Practice", introductory experiential education designed to support patient care skills competency, begins at the fourth year PharmD students at the Faculty of Pharmacy, Silpakorn University. However, the social expectations and accountability of pharmacy activities have been rising as a result of the change of the pharmacy program in Thailand and other countries. The community needs the expansion of the clinical role of a pharmacist in the health care system, for example, communication between the pharmacist and the patient on the medical use (Kaae et al., 2012). Therefore, pharmacy education should play an important role to prepare the students in order to achieve community needs.

To respond to needs in society and CPEF recommendation, pharmacy students should have the opportunity to be involved in the health care system at the beginning of the program. The integration of primary health care in community to pharmacy education is beneficial to the community's health and the students' learning. To prepare our students, we developed early experiential activities before the structured introductory pharmacy practice experience course and implemented these with third year students, with the collaboration of the pharmacy school and the community. Since the Thai Pharmacy Council and the Thai government have presented the importance of primary care, a learning experience from community is an important teaching method for pharmacy students. Therefore, our third year students had practiced in a community. However, we were considering what activities promoted strengthening patient care knowledge. We found effective activities in pharmacy practice experience program from several schools (Zeitoun et al., 2014; Ann et al., 2012; Barbara et al., 2006; David et al., 1998; Denise et al., 2004; Phayom et al., 2009). All programs have been implemented for more than10 days.

For our early experience activity, pharmacy students had to spend for a total of 10 days. No study had been complied with our program. Then we designed the community-based learning activity appropriated with a short experience course that integrated students' knowledge and basic skills in health care system including public health concepts applicable in pharmaceutical care, health care team, and health system in the community. Therefore, the objectives of this study were to design and evaluate outcomes of an early experiential activity through community-based learning including students' knowledge and students' and healthcare practitioners' attitude.

Materials and methods

This quasi-experimental study was the design and the appraisal of the early experiential activities implemented with third year pharmacy students during academic year of 2015 at Silpakorn University. The activities in the intervention group were designed as an alternative community-based activity for students, whereas the usual activities of healthcare practitioners were assigned for the control group.

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Designing of community-based activities

A pharmacist, a faculty member and health care practitioners from six District Health Promotion and Prevention Centers were invited to participate in a group discussion. During the group discussion meeting, the researchers reviewed and presented the importance of PHC concept and possible activities from several countries that promoted PHC knowledge. The participants were asked to present their usual activity and propose the activity or concept that can improve students' PHC knowledge. The group discussion decided to integrate health system and basic health care concepts into activities. Finally, 4 activities were designed for an alternative community-based outreach activity according to PHC concept. Consequently, a 10-day program was developed for the intervention group.

The10-day program for intervention group comprises 4 activities; home visits, health screening, group health education, and case presentation and discussion, as presented in figure 1. The details of activities were presented in Table 1. For the control group, the details of activities depended on routine activity of each center for 10 days. These routine activities actually included one or two out of the 4 activities implemented in the intervention group. In addition, both groups undertook self-study regarding drug lists and drug systems in the center during 10 days practice experience. The activities were implemented in six District Health Promotion and Prevention Centers during July to August, 2015.

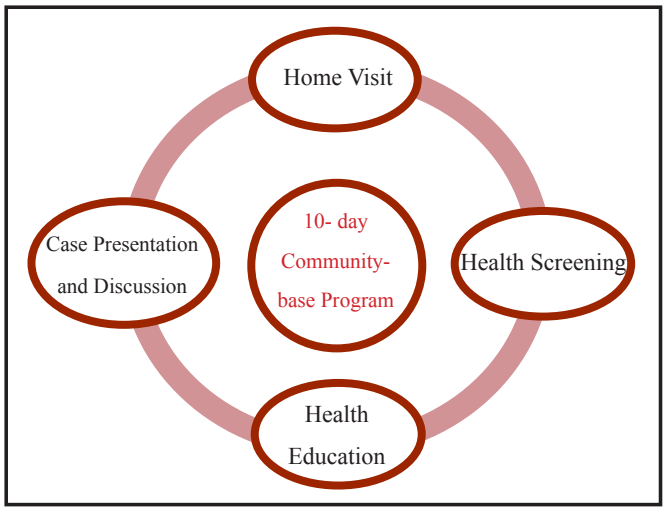

Figure 1 10-day program community-based activity

Study sample

The study sample was 70 third-year pharmacy students who registered for the early experience program at the first semester, academic year 2015 and volunteer to practice in the c ommunity. The students were divided into 6 groups, 10-12 students each. Each group was assigned to participate in a 10-day program in one of the centers. Each student selected one of 6 District Health Promotion and Prevention Centers in Nakhon Pathom to practice. Six centers were randomly selected to provide activities either as the control group or the intervention group. Finally, the students, who selected to practice at the following District Health Promotion and Prevention Center, Wangtagoo, Nongpaklong, and Phrongmaduea, were the intervention group. The others were in the control group. During the 10-day program, a researcher had monitored activities provided by each center to standardize between the intervention and control groups.

Outcome evaluation

Knowledge evaluation

The students' knowledge in health system and basic health care was evaluated before and after the 10-day program both in the control and the intervention groups. The knowledge level was measured by a knowledge test. The test was developed in the multiple choice format for 20 questions and 5 choices each. The knowledge testing questionnaire was composed of 10 questions on health system and 10 questions on basic health care. The validity and reliability of the test were conducted and the final version of the test was applied. The reliability was tested in thirty 3rd year students, excluded from the students in this study and analyzed by calculating Cronbach's alpha coefficient. The result of alpha was 0.72. Some questions were revised to improve its reliability. Independent sample t-test was used to compare knowledge score between the intervention and the control groups and paired t-test was used to compare pre- and post-test of each group.

Students' and healthcare practitioners' attitude evaluation

The students' attitude of toward the 10-day program was evaluated and compared between the control and in the intervention groups after the 10-day program. The attitude was measured by a 5-Likert scale questionnaire. The questionnaire was tested for validity and reliability. The result of Cronbach's alpha coefficient was 0.87. Only independent t-test was used to compare the attitude between both groups. Attitude toward each activity in the 10-day program was assessed in the intervention group.

The attitude of healthcare practitioners including nurses and public health care officers toward community-

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based activities was evaluated by group discussion after the program.

Results

Demographic data of students

Of 70 third year pharmacy students aged between 20-25 years old, 38 students were in the intervention group, the other 32 were in the control group. There were no significant differences at baseline by gender, Grade Point Average (GPA) and age between both groups. (Table 2)

Knowledge of pharmacy students

At baseline, the knowledge total score in PHC was 8.66 ± 0.67 and 8.41 ± 0.64 in the intervention and control groups, respectively. There was no significant difference (p=0.122) between both groups by total score, basic health care score and health system score. After finishing the 10-day program, the total score of the intervention group was 13.08 ± 1.17 and that of the control group was 11.88 ±1.07. Total score, basic health care score and health system score of the post-test were statistically different from the pre-test score ($p < 0.01$). (Table 3)

After implementing the program, a significant difference was found in total score between the intervention and the control groups. Similarly, the basic health score was significantly higher in the intervention group with 6.48 ± 1.03 than in the control group (5.50 ±0.67). However, there was no significant difference by health system score between two groups. (p=0.162)

Table 5 illustrates attitude of the intervention group toward each activity in the 10-day program. Students thought that their knowledge of basic health care and health system was strengthened through all activities with a score ranging from 3.64 to 4.52 (total score 5). Students responded that the home visit was the most beneficial activity to applying knowledge to the community. Some students encountered drug use problems of patients during the home visit, and then they directly gave advice to the patients. Additionally, all the activities provided the students with a primary health care concept as proposed, and the students perceived that they had been helpful to the community.

Attitude of the Pharmacist and Health Care Practitioners

All the participants were satisfied with the activities and willing to join the program every year. The pharmacist responded that this program was the first activity for students to join in community and learn through an actual setting. After finishing the program, the patient care experience encouraged students to have a provision health care for others and community. The pharmacist believed that the program contributed students to understand health and drug use situation in the community. Moreover, the activity of case presentation and discussion was beneficial for both students and patients. Some problems of the patients were solved and the serious cases were systematically referred to health professionals. The pharmacist reported an example of a case that students helped as follows:

"A group of students visited a patient at home. The patient was male, 60 years old, and diagnosed as having liver cirrhosis for 1 year. The medication was 10 milligrams of propranolol once a day. After reviewing literature guideline and discussing with pharmacist, students found that dosage regimen of propranolol in liver cirrhosis was too low then they asked the patient to re-visit a physician at the hospital with a referral note. The patient went to the hospital and his dosage regimen was changed. The patient was better after having a new regime."

For this case, the pharmacist reported that the students were proud of themselves. Although the students had not learned pharmacotherapy, they learnt how to interview a patient for a systemic review and medication use. They noted down the patient's medication and discussed them with the pharmacist. Subsequently, they encouraged the patient to re-visit a doctor. This is an important skill for patient care.

From the health care practitioners' view, the program was satisfying. Not only did patients improve their health, but also some health volunteers gained knowledge from going out with the students. Although the students were less experienced, they had knowledge of some diseases and the health system. They could share their knowledge with health volunteers and patients. However, the health care practitioners would like to join the case presentation and discussion activity with the students, the pharmacist and the faculty members. One of health care practitioner's views was noted as follows.

"I would like the faculty members to invite health care practitioners from the hospital to join the case presentation and discussion. I would like to know the case discussion so that we can follow up the patients properly after finishing the program."

Furthermore, the health care practitioners commented that students should report on patient's problems and guidelines for solving the problem, and then should deliver this information to health care practitioners for monitoring. This action of knowledge sharing between health care practitioners and the Faculty of Pharmacy and would be beneficial to the patient.

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Table 1 The 10-day program activities in the community

Activities	Details of activities (Intervention group)
Home visit	• 1-2 students were assigned to visit 1-2 families in the community led by the health volunteers of each community. • The student activities were: • review a patient profile, visit a family 2 times to interview the actual patient and provide information to individual patient on physical health, mental health and social activity refer the patient to the hospital (when it is necessary).
Health screening	• Students had to join in the multidiscipline health professional team of the hospital to screen health problems, risk factors and diseases in the community. • The student activities were: • test fasting plasma glucose, • monitor blood pressure, • calculate body mass index, • refer the patient who had a health problem to hospital.
Health education	• Students were assigned to educate chronic patients or people with health risk factors. • The activity was: Provide2-hour entertainment education program for a group of patients.
Case presentation and discussion	• Students presented and discussed a case study with the pharmacist or the faculty members once a week. • In a serious case, the students can discuss the problem with the faculty members more frequently.

Table 2 Baseline characteristics of pharmacy students (n = 70)

Characteristics	Intervention group (n = 38)	Control group (n = 32)	p-value
Gender			
Male	12 (31.58%)	10 (31.25%)	0.970*
Female	26 (68.42%)	22 (68.75%)	
Grade Point Average (GPA)			
3.51-4.00	3 (7.89%)	3 (9.37%)	0.581*
3.01-3.50	16 (42.10%)	17 (53.13%)	
2.00-3.00	19 (50.00%)	12 (37.50%)	
Age (mean + SD)	20.22 + 1.65	21.15 + 0.77	0.983**

*chi-square test **Independent t-test

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Table 3 Knowledge scores of the intervention and the control groups (n = 70)

	Control group (n 32) mean ± SD		p-value*	Intervention group (n = 38) mean ± SD		p-value*	p-value** Compare 2 group before	p-value** Compare 2 group after
	pre	post		pre	post			
Total Score(20)	8.41 ± 0.64	11.88 ± 1.07	< 0.010	8.66 ± 0.67	13.08 ± 1.17	< 0.010	0.122	< 0.010
Basic Health Care(10)	4.28 ± 0.45	5.50 ± 0.67	< 0.010	4.47 ± 0.50	6.48 ± 1.03	< 0.010	0.103	< 0.010
Health System(10)	4.12 ± 0.45	6.38 ± 0.87	< 0.010	4.13 ± 0.34	6.63 ± 0.64	< 0.010	0.532	0.162

*Paired t-test **Independent t-test

Table 4 Student self-assessment toward the activities (n = 70) mean ± SD

Topics (total scores = 5)	Intervention group (n = 38)	Control group (n = 32)	p-value*
Satisfaction of the program	4.29 ± 0.46	4.00 ± 0.36	0.008
Positive attitude to pharmacy profession	4.42 ± 0.50	3.94 ± 0.62	0.004
Gain patient care experiences	4.03 ± 0.28	3.65 ± 0.55	0.005
Apply the new knowledge to the classroom	3.99 ± 0.62	3.44 ± 0.50	0.008
Gain new knowledge	4.02 ± 0.37	3.00 ± 0.51	0.002
Apply the knowledge to practice	3.02 ± 0.43	2.75 ± 0.44	0.010

*Independent t-test

Table 5 Attitude of the students in the intervention group toward the activities (n = 38) (Total scores = 5)

Activities	Basic Health Care concept mean ± SD	Health System concept mean ± SD	Primary Health Care concept mean ± SD
Home visit	4.52 ± 0.31	4.12 ± 0.22	4.33 ± 0.32
Health screening	4.15 ± 0.42	4.24 ± 0.34	4.21 ± 0.22
Health education	3.85 ± 0.22	3.64 ± 0.31	3.76 ± 0.24
Case presentation and discussion	4.32 ± 0.22	4.07 ± 0.32	4.11 ± 0.34

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Discussion

The early experiential education program has strengthened patient care experiences in which pharmacy students learn through the community. This program helps students to understand and increase their knowledge in the concept of basic healthcare and health system. Since strengthening Thai pharmacy student practices with actual patients can increase patient care experiences (Phayom et al., 2009). Normally, students learn patient-oriented topics in the classroom; so they lack experience to deal with the actual situation. Learning from actual patients strengthen students know how to apply the knowledge they have learned from the classroom. However, planning and structuring outreach activities for the community-based learning, including observation and practice health screening, home visits and health education, can improve students' knowledge in the basic health care concept and attitude to pharmacy profession in the intervention group rather than in the control group. As the results, students learned both the professional's and the patient's viewpoints. The students were guided to recall their knowledge and how to manage the patients' health problems systematically. As Brown and colleagues presented, early pharmacy education with the community provides students with an opportunity to gain context of people's health and life (Brown, 2002).

For the intervention group, the students indicated home visit was the most satisfying activity. This activity encouraged students to determine patient's context, interview and discuss with actual patients. Then students can integrate all information to understand the patient's health problem and sometimes can provide health information to the patient. This activity challenge students to provide more variety services for patients.

Although the students commented that all program activities enabled them to apply their knowledge to the community, the students rated their knowledge applicability with a low score. The possible reason was the third year students have studied a few of patient-oriented courses, and they have little experience on how to apply to a patient and a community. The program had included 1-day brief lecture on a basic physical examination and patient interview techniques to increase the students' knowledge. However, the short brief may not have been enough for the students to practice with actual patients and a community. Students who could detect patient's drug use problem and refer them to a physician, applied basic physical examination techniques and had a discussion with the faculty members and the pharmacist. It is clear that patient interview techniques and a basic physical examination are important for students' learning in the community (Arden, 2012). The program should teach the students these two concepts before integrating them into the community. These two principles could be taught for students in the classroom, which will promote their self-confidence when dealing with patients. After finishing the program, all students have aimed to attentively learn in the classroom lecture. With their intention, student might be able to apply the in-class knowledge into the real practice.

The well preparing of practice sites could expand the opportunity for students to learn in the experiential education program (McGivney, 2009). The 10-day program of community-based learning in the collaboration with faculty members and the pharmacist was a strategy to implement an early experiential program of patient care for students. It was confirmed that the students should be familiar with patient care skills before starting the experiential education program (Kassam and Volume-Smith, 2003). This collaborative program represents the integration of the pharmacy education and the community in Thailand. Integrating students into the community in the early experiential education program, and direct working with health care practitioners, enhanced the students' patient care knowledge and attitude. Students can also learn how to be a part of a health care team in the community. The community-based practice site was an innovative partnership in which the pharmacy preceptor is not adequate for a nearly experiential program. Expanding the partnership to other health care practitioners is an immense opportunity forpharmacy education.

All participants in the intervention group including students, faculty members, a pharmacist, health care practitioners, and patients were mostly satisfied with the program. Academically, students and faculty members succeeded in the development of the 10-day program. In congruence with other research findings (Brown et al., 2002; Miriam, 2004.), the community outreach activities enhanced the students' patient care knowledge and the positive attitude of the students. These benefits will encourage the students to help to manage health problems for the community in the future. With regard to the practitioners, both the pharmacist and healthcare practitioners were pleasure from sharing knowledge with students and faculty members. Case discussion with the team is motivating for practitioners

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learning from the patient's drug use problem. Moreover, the patients themselves were satisfied with ability of students. The students assisted the patients to take care of their health and gave useful information to the patients. However, although the 10-day community-based learning is beneficial to all participants, there is a limitation of students' transportation. The students could not access some chronic patients who live far from the main road. Therefore, the students and these patients lost the chance to learn from each other.

Conclusions

The early experiential education, 10-day community-based program is helpful for pharmacy students, health care practitioners and patients in the community. The activities are practical in the Thai context. In order to achieve this benefit the activities should be integrated into the pharmacy curriculum at the beginning. The students can strengthen their health care knowledge and increase their enthusiasm for the pharmacy profession. Learning from the community is a pivotal experience enabling the students to encounter existing situations and apply their knowledge to patients.

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