



Offering Clinical Pharmacy Clerkship in Hospital for Pharmacy Student: A Successful Cooperation between Medical and Pharmacy Schools

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ABSTRACT

Background: Pharmacy education has been changed in recent years. Pharmacy students need more practical and clinical skills which come from direct interaction with patients and other health care providers. To achieve this, students need more effective courses and clerkships. In this paper we describe our method to design and evaluate clinical pharmacy clerkship for the first time in Ahvaz Jundishapur University of Medical Sciences (AJUMS).

Methods: To determine the most beneficial way of education we designed a pilot study in educational hospital of AJUMS. After analyzing the conclusions from pilot study, 40 fifth year pharmacy student divided in ten groups and each group had a six week rotation in three different wards under supervision of medical residents. Each student was asked to provide evaluations during six total weeks of three different rotation sites.

Results and Discussion: Clinical pharmacy clerkship led to successfully improved clinical skills for students such as being familiar with different practice environments, direct communication with patients and medical team and participation in direct patient care activities. All the students participate in the course could pass the final exam and 85% of students believed this would be a necessary education course in their clerkship programs. Although there were some problems but pharmacy students benefited from this course and it gives them advantages in clinical knowledge and professional communication skills.

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Introduction

Pharmacy education has been changed in recent years and continues to become more clinically directed. Iran's Accreditation Council for Pharmacy Education refined standards and guidelines for pharmacy schools and colleges in 2006. Based on these new standards, clinical sciences are necessary for pharmacy students because of

their role in patient care and improvement of health care outcomes (1). Having Pharmacy graduates, trained with other health care professionals are one of the visions of pharmacy schools, as a result patient care services could be provided by a team (2).

Today many pharmacy schools worldwide have started to review their courses and design new educational methods which lead to more practical clinical skills for pharmacy students (3, 4).

In Iran clinical pharmacy clerkship is a course for the last year Pharm D students in hospital ward sites. In this course students can have direct interaction with patients

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and other health care providers which would help students to build confidence and encourage them to become more involved in pharmaceutical care. Clinical clerkship also educates students the role of pharmacy care plans in patient care, inter-professional team decision making and care provision (5).

This course should be supervised by clinical pharmacy specialists and residents in hospital. So far, as there is no permanent clinical pharmacist resident in Ahvaz Jundishapur University of Medical Sciences educational hospitals, due to lack of supervisors, pharmacy students have not been able to benefit from this course leading to insufficient clinical skills.

Therefore, we decided to design a new method to overcome this problem and find a way to benefit from pharmacy and medical schools' cooperation.

In order to have pharmacy students taking clinical clerkship rotations in different wards, we got help from medical residents and attending physicians for supervision (6).

The aims of this clerkship are:

- Knowing the principles of patient care and improving communication skills with other health care professionals,
- Understanding the role of pharmacy care plans in patient care,
- Monitoring for positive and negative drug therapy outcomes,
- Improving basic knowledge of common clinical laboratory and diagnostic tests,
- Practicing evidence-based medicine,
- Knowing the principles of clinical practice guidelines for various disease states and their interpretation in the clinical settings,

These goals are the must-know and must-have skills for a pharmacy student (1).

Methods

To evaluate and assess the potentials and find students' needs and feedbacks on this course, we designed a primary clinical clerkship (pilot study). In this program, 40 last year pharmacy students, divided in 10 different groups, attended seven different hospital wards including dermatology, neurology, infectious disease, psychiatry, pediatrics, internal medicine and surgery, each for one week. These wards provide broad range of practice necessary for pharmacy students (7). After these seven weeks of rotations students filled a questionnaire (Table 1 shows the items of this questionnaire). The purpose of this questionnaire was to assess the students' point of views on the learning quality of each ward and also to see whether one week is a proper duration for a rotation or not. Also we sought their opinion on efficacy of this program, whether this clerkship met their educational needs or not. Students also recorded patient information in monitoring

forms designed by a clinical pharmacist, and reported drug history, adverse reactions and drug interactions (if any) of a selected patient.

After finishing the course, all the students involved in the pilot study took an exam, and the monitoring forms mentioned above were evaluated by a clinical pharmacist.

For good preparations for the final course plan, the details of the pilot study were discussed with medical teams. Arrangements were made so medical residents would supervise pharmacy students while they are monitoring the state of disease and drug therapy regimen of patients. Supervisors also would help pharmacy students to engage in better professional communications with patients and guide them on collecting necessary information.

According to the results of primary questionnaires, another 40 last year pharmacy students, divided in 10 groups, attended a two week rotation in three out of four available wards (dermatology, psychiatry, pediatrics and internal medicine were sites pilot study students had effective learning).

The final course plan was designed based on two parts: theoretical education and practical education. For practical education, 10 groups of pharmacy students had a two week rotation in three different wards. This made the complete course a six weeks clerkship in hospitals. During this course, pharmacy students attended everyday rounds just like medical interns. They had the duty of following one patient and filling a monitoring form. This form was designed by a clinical pharmacist and consisted of patients demographic information, present illness, history, drug therapy regimen, side effects (if any), drug interactions (if any), other drug related issues and their comments and interventions..

Theoretical education consisted of interactive lectures about concepts of pharmacists providing patient care and basics of professional communication with other health care team and patients. These lectures were given by clinical pharmacy academic members. Every week all the students attended these lectures. Also in every session all the students should be ready to present one of their patients in a case presenting format very similar to medical morning reports. The teacher and other students would then discuss the case.

For evaluating the efficacy of the clerkship, all the students took an exam evaluating their knowledge and skills in clinical pharmacy. The forms students filled on site were also evaluated and based on their quality, were considered unacceptable, basic, beyond the basic or professional. A basic form is filled with essential knowledge and practice (mark between 14-16), beyond the basic with an intermediate knowledge and practice (mark between 16-18) and professional being the best way to monitor this patient (mark between 18-20). Another part of the evaluation was given by the students' supervisors (medical residents). At the end of the program all students

Table 1. The results of questionnaires filled by the students involved in pilot study.

	Item	Strongly agree	Agree	Neither agree nor Disagree	Disagree	Strongly disagree
Course	Things I learned on site were sufficient for my learning need.	8	10	10	9	3
Structure	The course's duration was sufficient for my learning needs.	4	5	5	20	6
Knowledge	I learned new aspects of clinical knowledge after finishing the course.	8	11	10	6	5
Interest	I believe this is an essential course for pharmacy students.	16	12	4	3	1
	I would recommend it to other pharmacy students if this was an elective course.	14	12	8		
	After finishing this course I became more confident as a pharmacist.	8	8	10	9	5
	The onsite part of the clerkship was stimulating and interesting.	12	7	8	6	3

Table 2. Comparison of final evaluation of the students ($P < 0.05$ (paired sample t-test)).

Final score	Pilot course		Final course		Difference in mean score
	Number of students (n=40)	Score (mean \pm SD)	Number of students (n=40)	Score (mean \pm SD)	
< 14	5 (12.5%)	11.5 \pm 1.3	0		
14-16	20(50%)	14.7 \pm 0.44	14 (35%)	15.23 \pm 0.87	
16-18	13(32.5%)	16.8 \pm 1.05	22 (55%)	17.1 \pm 1.2	
18-20	2(5%)	18.6 \pm 0.5	4 (10%)	19.46 \pm 1.4	
Mean final score		15.4 \pm 1.2		17.26 \pm 2.00	+ 1.86*

answered a modified questionnaire about the quality and efficacy of the clerkship. Table 3 shows the items asked on this questionnaire.

Results

This study was conducted at Ahvaz Jundishapur University of Medical Sciences (AJUMS) educational hospitals. Forty last year pharmacy students were enrolled in the pilot part (the first year of the study). Evaluation of their end of program questionnaires showed that dermatology, psychiatry, pediatrics and internal medicine wards were the most useful for pharmacy students to learn principals of patient care and improving the communication skills. Also 70% of students believed this course is essential for their learning and in spite of many deficiencies they were enthusiastic to have longer duration of rotations and attend more sites. Table 1 demonstrates the results of pilot study questionnaires.

Another 40 last year pharmacy students were evaluated after taking the program. Their evaluation was made by considering the final exam score, patient form evaluations, and supervisor feedbacks. A 14/20 or higher point was considered passing grade.

All students passed this course (mean final score : 17.26 \pm 2.00). Evaluation of the patient monitoring forms showed that they all learned the basic clinical knowledge and practice essentials as a pharmacist on site.

Table 2 shows the results of final evaluation of the students (pilot and final courses).

As shown in Table 3, 85% of pharmacy students believed that clinical pharmacy clerkship is a necessary course for them and more than half of them thought they became more confident as a pharmacist after this course.

Although there was no clinical pharmacist in the hospital to supervise pharmacy students, 62.5% of students said that the medical residents were very keen to teach and guide them through the course.

Discussion

Clinical pharmacy clerkship for pharmacy students in Iran is a course presented by pharmacotherapy faculty. The standard way to offer this course is having a clinical pharmacy specialist or resident supervise pharmacy students on different sites and wards. Since clinical pharmacy is young compared to other faculties of Iran's pharmacy schools, there is a lack of academic members in some schools. But in some universities like

Table 3. The results of questionnaires filled by the students involved in final course plan.

	Item	Strongly agree	Agree	Neither agree nor Disagree	Disagree	Strongly disagree
Course	What I learned on site was significant according to my needs	18	17	2	2	1
Structure	The rotations' durations were sufficient for my needs	11	18	2	5	4
	Supervisors helped me solve problems I faced	10	15	8	2	5
Assumed Knowledge	Clinical knowledge and practice I learned after this course was beyond the basic needs	15	18	2	3	2
Teaching	The weekly lectures were useful and interesting	15	10	5	8	2
Delivery	I learned how to use necessary references	21	15	1	2	1
	The case presentations discussed in class were useful	16	9	8	5	2
	Teachers and supervisors were interested in teaching students	12	15	4	6	3
Feedback	The feedback I received during my clerkship helped me improve my potentials	15	14	3	5	3
Interest	I believe this clerkship is an essential course for pharmacy students	23	11	2	2	2
	I would recommend this course to my classmates if it was an elective course	18	14	3	1	4
	I became more confident as a pharmacist after this course	12	11	10	5	2
	The rotations were stimulating and made me interested in clinical courses	18	18	3	1	0

AJUMS the problem is the lack of clinical pharmacy attending, residents or a fulltime clinical pharmacist in educational hospitals (8). In such cases, this course either will be limited to lectures in class, which is in contrast to its clinical nature or the pharmacy students will go to educational hospital wards un-supervised and without any learning objectives or guidance. The latter has little value in learning clinical skills and students taking the course this way often complain that it's more like a waste of time. Also in both methods the clinical knowledge and practice of students cannot be correctly evaluated (9, 10).

As academic members of clinical pharmacy faculty at AJUMS, facing this problem, we designed a clinical pharmacy clerkship program best suited according to our needs and sources. The best way to overcome lack of supervision and guidance on site was to get help from medical residents due to their method of training and clinical approach.

This program could lead to interactive communication with other health care professionals and enables pharmacy students have face to face interaction with patients admitted to hospitals (11).

Our results showed a significant increase in final score of the students compared to the pilot study. Also the students believed this course is necessary for their learning needs.

Offering clinical pharmacy clerkship with this method is not free of fault but so far according to the students' opinions, this course has improved their clinical knowledge and skills. Also this method could be a model for other pharmacy schools that have the same problem.

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