

## Pharmacy Students' Self-Identified Interests in a Hospital Pharmacy Internship Course in Iran

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### ABSTRACT

**Introduction:** After revision of pharmacy curriculum by, Iranian Health and Education Ministry reviewed in 2005, it was decided that pharmacy students need extra internship courses such as hospital internship course. Hospital internship course could provide students with the opportunity to acquire the knowledge and master the skills required for current pharmacy practices in community and hospital setting. The aim of this study was to identify and analyze pharmacy students' experiences during hospital internship. **Methods:** Each student attended in 3 wards and provided a logbook for each ward. Students were asked to document at least one topic interesting for them on each day. The collected information was divided into sections and analyzed using SPSS ver 14. **Results:** Seventeen students enrolled in the course. Endocrinology and nephrology wards had the highest and neurology the lowest number of attended students. Seven hundred and one reported learning subjects were divided into 24 areas. The highest numbers of reported topics were the drugs indications, adverse drug reactions and diagnosis of diseases while the lowest number was pretreatment laboratory tests, pharmacoeconomy, counseling medical staffs and off label use of medications. Gastroenterology and endocrinology wards with 210 reports had the highest and neurology ward with 12 had the lowest number of reports. **Conclusion:** Completing the logbooks was an encouragement for students to seek and document and learn new topics and also a major feature of the clinical assessment scheme of the course. The majority of the reported topics were learning objectives but not the interventional ones. The present study showed us some areas of pharmacy education which need further attention.

### Introduction

In Iran, pharmacy education is a Doctor of Pharmacy degree (Pharm. D) and pharmacy students need to study 209 credits in 10 or 11 semesters. During this educational program, the pharmacy faculties seek to educate students in various pharmacy sciences including basic sciences and specialized pharmacy topics. Pharmacology, toxicology, pharmaceuticals, pharmacognosy and therapeutics are examples of the pharmacy specialized topics.

In the past, students only studied a total of 4 credits of internship in community pharmacies and industrial

settings. In 2005, Iranian Health and Education Ministry reviewed pharmacy curriculum and decided that pharmacy students need extra internship courses such as hospital internship course. This intended to provide students with the opportunity to acquire the knowledge, adopt attitudes and master the skills required for current pharmacy practices in community and hospital setting. One of the newly introduced courses was hospital pharmacy internship. Similar courses were performed currently in the United State of America,<sup>1-3</sup> Japan,<sup>4,5</sup> Philippines<sup>6</sup> and some other countries. There are also similar programs

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for postgraduate clinical pharmacy residents in Tehran and Shahid Beheshti Medical Universities, but our was the first for undergraduate Pharm-D students in Iran. The aim of introducing this particular course for pharmacy program was to enable pharmacy graduates to provide patient-oriented care and ensure optimal medication therapy outcomes and in summary provide pharmacy students with clinical insight through active participation in patient care at the interdisciplinary level, which was absent in the previous programme.<sup>7</sup> This course could also help pharmacists to become involved in the education of patients. Another advantage was that this course could bring pharmacists closer to other health care providers, resolving the problem of pharmacist only as an observer of patient treatment process. The hospital pharmacy education was a newly introduced course in our faculty the first one in Iran and there was no available process of learning activities evaluation for our students.

In 1975, Stritter and coworkers indicated that students action in influencing their own experience could be more valuable than their teachers effect and they recommended enablement of students in apprehending the opportunities available to them.<sup>8</sup> Logbooks usefulness in the education of medical students has already been shown.<sup>9</sup> Therefore, we decided to introduce a logbook for documenting learning objectives during hospital pharmacy internship. This logbook encouraged students to look for their favorite subjects and document them for their further study.

The aim of this study was to evaluate the pharmacy students self-identified interests in hospital pharmacy internship course to recognize the areas for future internship program.

## Methods

The hospital internship course was a 6-credit course (306 hour) which included 5 preliminary workshops and a 1-month and two 2-week ward attendances. The workshops included; introduction to hospital structure, ethics in hospitals, introduction of patients records, abbreviations used in hospital settings and preparation of fluid therapy and intravenous additives. The included wards were psychiatry, nephrology, hematology-oncology, endocrinology, gastrointology and neurology wards. Students were free to choose either hospital internship or industry internship course. They were supervised by medical team of the wards and also by a pharmacy faculty member during hospital internship. Seventeen senior students enrolled in the study.

As part of evaluation scheme, a logbook was given to each student at the beginning of each ward. In each logbook, there was a section in which students were asked to complete a table regarding the subjects they experienced or liked each day of ward attendance (Table 1). There was no limitation to the number of the reports for the students but they were asked to record one entry each day.

Students were free to document all information related to the entry as long as they did not invade patients right or confidentiality or rights. Percentages of the reported subjects were calculated and analyzed using Microsoft Excel 2007 and SPSS ver 14. The data was also adjusted based on hospital duration. This was a descriptive study.

**Table 1.** The subjects that pharmacy students experienced or liked each day of ward attendance.

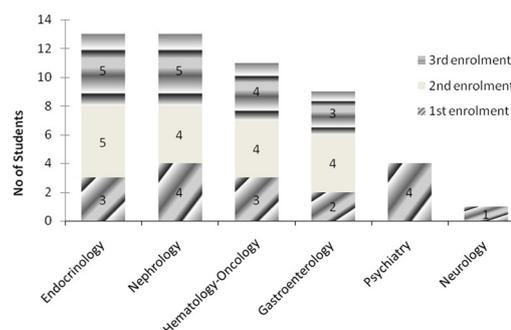
Date:	
Event of day	
Interesting point	
Your opinion	

## Results

The number of students attending in each ward was highest for endocrinology and hematology-oncology wards with 13 students in each, and the lowest number was for neurology with only 1 student. The number of students enrolled in each ward is shown in Figure 1.

A total of 701 topics were reported during an eight-week course in 24 different areas. The information was collected and divided into 24 areas (Table 2). These categories included drug indication, adverse drug reactions (ADRs), diagnosis, ADRs control, treatment procedures, diagnostic tests, dosage, contraindication, administration and correct storage method, drug-drug interaction, laboratory tests, formulation preparations, efficacy, diet, patient education, dose adjustments, wrong usage by patient, no effect by medicines, pregnancy safety, pre-treatment tests, pharmacoconomy, drug-food interaction, providing information to medical staffs, and off label use of medications. Mean number of learning points for each topic in each ward was  $8.73 \pm 40.41$ , ranging from 0 to 42. On average for each student/ward, there was a ratio of 13.7 reported learnt subjects.

The highest number of reported topics was for the drugs indications (162 reports), ADRs (157 reports) and diagnosis of diseases (100 reports). The lowest one was pre-treatment tests, pharmacoconomy, drug-food interaction, providing information to medical staffs and off



**Figure 1.** Number of students in each ward during three enrolments.

label use (1 report each) and non effective medicines and pregnancy safety (2 reports each).

The reported indications were those studied before but observed by the students first hand in the wards. The ADRs included various aspects including the ADRs recognized by the students or the medical team. After observing ADRs first hand, the students stated that they become more aware of the side effects of the medications.

Gastroenterology ward had the highest number of reports, followed by endocrinology, haematology-oncology, nephrology, psychiatry and neurology but when duration of hospital attendance in each ward was taken into account, this order changed as; gastroenterology, psychiatry,

endocrinology, haematology-oncology, nephrology and finally neurology. In gastroenterology ward, drugs indications, treatment procedures, ADRs, diagnosis and diagnostic tests had highest number of reports while 9 topics had no reports. In psychiatry ward, ADRs was the highest reported learning topic. In endocrinology ward, drugs indications, ADRs and diagnosis of disease had highest number of reports and in haematology-oncology ward, ADRs, drugs indications and ADRs control were the highest reported topics. In the nephrology ward, drugs indications, ADRs and diagnosis of disease were among highest reported topics while in neurology ward, drugs indications had highest number of reported learning points.

**Table 2.** The information on learning points provided by students.

Wards	Hem-Onc*	Neph*	Endo*	GI*	Psyc*	Neur*	Total
<b>Reports</b>							
Drug Indication	28	36	42	39	12	5	162
ADRs	37	30	23	33	32	2	157
Diagnosis	17	20	22	31	9	1	100
ADRs Control	19	5	5	12	11	-	52
Treatment Procedures	-	-	-	38	-	1	39
Diagnostic Tests	5	-	7	22	-	-	34
Dosage	1	4	12	6	1	1	25
Contraindication	1	8	6	6	1	1	23
Administration and Correct Storage Method	3	3	3	4	8	-	21
Drug-Drug Interaction	1	3	2	12	2	-	20
Laboratory Tests	1	-	3	1	8	-	13
Formulation Preparations	9	1	2	-	1	-	13
Efficacy	1	-	8	-	-	-	9
Diet	1	-	3	2	-	-	6
Patient Education	-	-	3	2	-	1	6
Dose Adjustments	2	1	-	1	1	-	5
Wrong Usage By Patient	-	2	1	1	-	-	4
No Effect by medicines	-	-	2	-	-	-	2
Pregnancy Safety	-	-	-	-	2	-	2
Pre-Treatment Tests	1	-	-	-	-	-	1
Pharmacoeconomy	1	-	-	-	-	-	1
Drug-Food Interaction	1	-	-	-	-	-	1
Providing Information To Medical Staffs	1	-	-	-	-	-	1
Off Label Use	-	-	1	-	-	-	1
Total	130	113	145	210	91	12	701
Mean	7.2	10.3	8.5	15	7	1.7	22.6
SD	10.8	12.5	10.9	20.9	8.6	1.5	46.6
No per student	11.8	9.4	11.2	23.3	22.8	12	14.6

\* Psychiatry (Psyc), Nephrology (Nep), Hematology and Oncology (Hem-Onc), Endocrinology (Endo), Gastroenterology (GI) And Neurology (Neur) wards.

## Discussion

Logbooks offer two types of learning opportunity. The first is to learn how to keep an audit by developing one's own processes for entering and storing the data and the second is to drive learning from the individual cases recorded in the logbook. The latter encourages the trainee to describe the learning impact and helps to drive

consideration of what has been learned from each case/incidence.<sup>10</sup> All the pharmacy students attending hospital pharmacy internship were required to keep a logbook as a mean to record the topics they were interested in during their hospital internship. The logbook provided a mean for documenting the subjects of interest or the deficiencies in training or exposure. The completed logbooks had high level of records of topics, which showed the amount of exposure opportunities for pharmacy students. Similar

method of assessing students during hospital internship was performed in Bath University.<sup>11</sup>

Medicines indications, diagnosis of diseases, and ADRs were the fields that had highest reports. These subjects are the ones that a pharmacist rarely witnesses at a pharmacy setting. It seems that once students were exposed to an environment different from usual setting of work (community pharmacy), they became deeply interested in the above subjects.

On the other hand, only in 7 notes, pharmacy students counseling was seen. This included medical staff counseling (1 case) and patients counseling (6 cases). Although the collaborating with patients, their families and medical staff is one of the responsibilities of pharmacists,<sup>12</sup> especially in hospitals, this was not obvious in the pharmacy students reports. We need to provide additional foundation for counseling tutoring during pharmacy education. This can be achieved by putting students in close contact with patients in real environments such as hospital internship courses.

Furthermore, there was no report of medical intervention amongst our students. This is a two-sided problem. One reason could be the lack of recognition of pharmacists as a part of medical team by other medical groups and the other one is lack of recognition of this duty or lack of confidence by pharmacy students. It seems that changes in the attitude of medical health system are needed before accepting pharmacists as a significant part of patient treatment team, meanwhile boosting pharmacists confidentiality should not be forgotten. Including pharmacy students into programs such as hospital internship could develop future pharmacists skills in contacting with both patients and medical staff. Expressing their opinion and documenting the learning subjects in a logbook is an appropriate way of recognizing weaknesses and strength of the course and also future requirements of the course. Based on these results, we noticed that the curriculum was more an observational one and it was necessary to change it to an interventional one in future executions.

There were different numbers of students attending wards due to the fact that choosing the hospital internship course was optional and students were free to select this course or industrial pharmacy internship based on their interests. After initial tendency toward participating in this course and division of the students into wards based of the number of initial students, some students decided not to attend this course and choose to attend industrial pharmacy internship instead. This was a limitation of the study. The course was mainly an observational one which needed to be changed in to a interventional one in future curriculums.

## Conclusion

The logbooks helped us to identify areas of interest or

lack of interest, and provided opportunities to modify our future internship program. By adjusting the curriculum and changing it to a more interventional one we believe there could be greater improvement in the course and also the performances of future pharmacists. We recommend that all trainees, from the initiation of community pharmacy to hospital pharmacy internship should keep a logbook containing the minimum and expanded datasets in addition to specific trainee data on learning and even supervision.

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## Competing interests

None to be declared.

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