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Assessment of Knowledge, Skills and Attitude among Pharmacy Students toward Hospital Pharmacy Internship in the Philippines

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Research Article

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Abstract

Objective. This study aimed to assess the knowledge, skills and attitude of pharmacy students toward hospital pharmacy internship program in the Philippines. It also aimed to identify the level of participation of students to the different internship activities and determine the governing factors associated with the learning outcomes of hospital pharmacy internship.

Methods. The study utilized a descriptive, correlational research design, using self-administered survey questionnaire as method of data collection. Descriptive statistical analysis and Pearson's Correlation Coefficient were used to analyze the data using IBM SPSS Statistics version 21.

Results. Students officially enrolled from the 10 Philippine Association of Colleges of Pharmacy (PACOP)–accredited schools participated in the study with an overall response rate of 65.3% (n=261). Students perceived to have gained additional knowledge mostly on drug classification, dosage forms, therapeutic uses, frequency and modes of administration. Communication skills were the most improved skills, while becoming respectful, sensitive and understanding were the most developed attitude. Age also significantly affects skills (p=0.02), while internship activities significantly affect the knowledge (p=0.00), skills (p=0.00) and attitude (p=0.00).

Conclusion. Overall, the students rated their internship experiences positively and perceived that hospital pharmacy internship program was effective in attaining its learning outcomes. Despite limitation of their participation to the different internship activities, students perceived to have acquired additional knowledge, improved skills and developed attitude from their hospital internship.

Keywords: *Hospital Pharmacy, Internship, Knowledge, Skills, Attitude, Learning Outcomes*

Introduction

Internship is the practice of gaining supervised practical experience. Its origin can be traced back to the middle Ages where it was a common practice to learn a trade under the direct supervision of a master craftsman. Today, internship has grown in popularity over the years, and is now a part of the formal education program[13].

Internship or experiential education [8] is an important part of the pharmacy educational system. Internationally, pharmacy internship programs have been thoroughly and extensively developed, discussed and periodically evaluated [4,17].

Practice-based pharmacy training has a long history, particularly in institutional pharmacy practice. Formal pharmacy residency training programs and accreditation standards were first developed in the early 1960s and have changed dramatically to meet the needs of practitioners, patients and employers[10]. In the United States, training programs had evolved from general internships through clinical practice, specialty residencies and fellowships, and the development of standards and competency-based training. As changes are being made in the health care system, the roles and responsibilities of the pharmacist are evolving in direct patient care. The knowledge and skills necessary to succeed in these clinical positions are obtained through postgraduate training through pharmacy practice, specialty residencies and fellowships[7].

Student internships in hospital pharmacy practice normally have responsibilities related to enhancing students' clinical skills in medication management intervention and patient outcome monitoring. These skills are critical to pharmacy practice[14]. The advancement in the role of pharmacist calls for them to be part of the broader health care team working for providing better health care for the patients[16]. Therefore, pharmacy schools should prepare a program, including internship training, which has competence with the changing role of the profession.

In the Philippines, however, there are limited published data and studies regarding pharmacy internship programs, specifically the hospital pharmacy internship. Despite its known value, there was no study evaluating the current status and condition of hospital pharmacy internship and whether its objectives are being achieved. Therefore, there is a need to assess hospital pharmacy internship program and identify the governing factors in attaining its learning outcomes. Strengths and weaknesses of the internship should be identified so that appropriate measures may be instituted for its improvement. Furthermore, this assessment may be used to specifically define the roles of pharmacy interns in the hospital pharmacy setting and may be used to introduce relevant changes to the pharmacy internship program. Finally, this study could be considered by pharmaceutical associations and academic institutions as basis to continuously develop, design and implement a comprehensive and standardized internship program.

Material and Method

A descriptive, correlational research design was employed in the study using survey as the method of data collection. The study population consisted of sophomore to senior pharmacy students from the ten (10) member schools of the Philippine Association of Colleges of Pharmacy (PACOP) in Metro Manila, and who have completed their 200-hour minor internship in hospital pharmacy.

The development of the instrument was based from the PACOP Internship Manual and Student-Service Learning Survey used by Jackel[8]. Demographic variables contained mixed questions about the student characteristics [sex, age, course, year level and type of school, pre-requisite subjects, use of PACOP Internship Manual and internship program/s taken and internship characteristics (type of internship site)]. List of activities were obtained from the PACOP Internship Manual. The respondents were asked to classify internship activities according to extent of participation using five (5) categories: A = Performed the activity most of the time (~80% of internship hours); B = Performed the activity but to a limited extent (~20% of internship hours), C = Not performed but allowed to observe the activity; D = Not allowed to perform nor observe the activity; and E = The activity is not provided by the establishment.

Learning outcomes of the hospital pharmacy internship program were classified according to knowledge, skills and attitude. This part was a five-point Likert scale type of question, measuring the extent of agreement of the respondents to each of the learning outcomes the student is expected to attain after internship (5=strongly agree and 1=strongly disagree). The knowledge and skills questions were based from the core competencies stated in the PACOP Internship Manual[14], while questions on attitude were adapted from Student-Service Learning Survey used by Jackel[8]. This was modified as applicable for the internship program.

All research data collected were prepared and encoded in Microsoft Office Excel 2007© for the statistical analysis. Each school was given a code for confidentiality purposes. IBM Statistical Package for Social Sciences© Statistics version 21 was used for correlation and descriptive analysis. Descriptive statistical analysis, measuring the frequency, mean and standard deviation, was employed to evaluate the different variables in the study. To investigate the relationship among independent and dependent variables, Pearson's Correlation Coefficient was used.

Results

Demographics

All ten member schools of PACOP participated in the study with a total of 265 students or 61.5% response rate. Majority of the respondents were females (78.9%; n=210) currently taking BS Pharmacy program (94.7%; n=250) and from private institutions (85.5%; n=218). Most of the students took hospital pharmacy internship program during their second year (45.5%; n=121) and majority of the respondents also knew that their school uses the Pharmacy Internship Manual created by

PACOP (47.2%; n=117). Prior to taking hospital pharmacy internship, students identified that they have finished taking the prerequisite subjects such as Hospital Pharmacy (80.5%; n=210), Drug Delivery System (46.0%; n=120), Drug Dispensing and Incompatibilities (20.7%; n=54), Biochemistry (18.8%; n=49) and Pharmacy Management (18.0%; n=47). Furthermore, majority of the students took their internship in private hospitals (60.3%; n=155).

Level of Participation to Hospital Pharmacy Internship Activities

In terms of level of participation, other than orientation to different activities ($\bar{x}$=2.45, SD=0.71), processing of medication orders ($\bar{x}$=2.34, SD=0.79) ranked as the second most performed activity. Patient therapeutic monitoring, assisting in IV and TPN preparations and research activities for pharmacy and therapeutics committee were the least participated activities. (See Appendix, Table 1.)

Table 1. Level of participation to hospital pharmacy internship activities.

Activities in Hospital Pharmacy Internship	Mean	SD
Orientation to the different activities	2.45	0.71
Processing of medication orders	2.34	0.79
Labeling and packaging of filled prescriptions	2.24	0.85
Tour of the hospital (where pharmacy services are involved)	2.22	0.81
Interpreting and evaluating medication orders	2.21	0.82
Delivering medication orders (to hospital or in-patients)	2.00	0.97
Check and code of controlled pharmaceutical products for proper storage	1.92	0.95
Recording of entries in prescription books or other required record books	1.92	0.98
Participate in ordering process and replenishment of stocks	1.88	0.99
Participate in inventory of non/pharmaceutical products	1.83	0.99
Assist in developing patient medication profiles (to selected patients)	1.50	0.92
Patient counselling	1.32	0.86
Conduct patient therapeutic monitoring	1.15	0.82
Assist in preparing IV admixtures or TPN	1.09	0.82
Participate in research activities for pharmacy and therapeutics committee	0.75	0.84
Total Mean Score	1.85	0.38

3 – Performed the activity most of the time (A); 2 – Performed the activity but to a limited extent (B); 1 – Not performed, but was able to observe the activity (C); 0 – Not performed the activity nor observed (D); NA – The activity was not provided by the establishment (E)

Knowledge, Skills and Attitude

Students have perceived attitude as mostly affected by internship as demonstrated by higher total mean score (4.00), followed by knowledge (3.92) and least effect on skills which has the lowest scores (3.79). Average scores for knowledge, skills and attitude are presented in Table 2. (See Appendix, Table 2.)

Table 2. Learning outcomes (classified according to knowledge, skills and attitude) gained by the students after completing hospital pharmacy internship program.

Knowledge	Mean	SD
Acquire knowledge on drug classification, dosage forms, therapeutic uses, frequency and modes of administration.	4.37	0.69
Familiarize myself with brand and generic names and manufacturer or distributor.	4.36	0.68
Understand the different barriers in communication (e.g. environment, patient and personal barriers)	4.17	0.73
Learn the different types of prescription errors.	4.13	0.87
Perform all activities in accordance with the laws governing the practice of pharmacy.	3.94	0.87
Gain knowledge on drug procurement and drug inventory management.	3.89	0.88
Learn the important components and strategies of effective patient counseling.	3.73	0.95
Demonstrate comprehension and understanding of the pharmacy laws.	3.70	0.92
Enumerate the legal requirements for establishing a pharmacy.	3.69	0.92
Learn more about the business principles of operating a pharmacy.	3.54	0.92
Gain knowledge on reporting adverse Drug Events (ADE).	3.54	1.04
Acquire knowledge in monitoring the patient's response to drug therapy.	3.52	1.03
Skills	**Mean**	**SD**
Verbal communication when dealing with peers, health care providers and staff (e.g. speaking)	4.15	0.85
Filling out a prescription or medication order accurately.	4.13	0.83
Non-verbal communication when dealing with peers, health care providers and staff	4.10	0.83
Identifying prescription errors quickly and correctly (if they exist).	3.87	0.85

Providing drug information	3.86	0.85
Applying functional knowledge while solving problems and making appropriate decision matters pertaining to the area of pharmacy practice.	3.66	0.89
Extemporaneous compounding of products and IV admixtures using good aseptic techniques.	3.55	0.98
Counseling the patients based on their needs (adjusting to patient needs,	3.50	1.05
Formulating therapeutic decisions, outlining the expected outcomes, impact and value of pharmacy services.	3.47	1.00
Identifying potential and actual drug interactions.	3.44	1.02
Attitude	**Mean**	**SD**
Become more respectful and sensitive when communicating with others.	4.47	0.67
Understand and appreciate people with diverse backgrounds.	4.36	0.69
Develop realistic ideas about the work world.	4.36	0.70
Develop awareness on community or social concerns in pharmacy practice.	4.32	0.71
Develop commitment to making a difference in my profession.	4.30	0.71
Receive an opportunity to explore a specific career in pharmacy.	4.29	0.75
Recognize my personal strengths and weaknesses in my profession.	4.28	0.75
Develop my ability to work and learn independently.	4.27	0.73
Demonstrate concern/empathy towards patients and/or clients.	4.27	0.78
Broaden my future employment possibilities.	4.27	0.79
Develop self-initiative in my community internship training.	4.26	0.80
Desire more the completion/pursuit of my pharmacy degree.	4.26	0.80
Gain a sense of personal achievement in community internship.	4.19	0.83
Collaborate effectively with peers, other health care professionals and patients to optimize patient care.	4.16	0.79
Feel that my classroom learning was enriched in my community internship.	4.16	0.87
Narrow my future possible career choices.	4.08	0.98
Increase my ability to become a leader.	3.89	0.86
Adhere to the national and international code of ethics for pharmacists.	3.82	0.85

Five-point Likert scale (5=*strongly agree;* 1=*strongly disagree*)

Factors Associated with Learning Outcomes

Across the different dependent variables, knowledge, skills, attitude and career choice were found to be significantly affected by internship activities. Age also had an effect on skills. (See Appendix, Table 3.)

Table 3. Correlation between internship characteristics, internship experience and satisfaction, and learning outcomes in hospital pharmacy internship.

		Knowledge	Skills	Attitude
Age	*r*	0.05	0.16	0.02
	p	0.48	*0.02	0.79
Internship Activities	*r*	**0.46	**0.49	**0.44
	p	**0.00**	**0.00**	**0.00**

*Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Discussion and Conclusion

It can be observed that most schools do not follow the proposed minimum curriculum requirements of Commission on Higher Education (CHED)[3]. The subject Hospital Pharmacy, for example, is supposed to be taken during the student's third year, second semester[3], such that the students will already have enough knowledge and skills about the pharmacy profession. This may affect the outcomes of internship program with regard to the acquiring of knowledge and skills.

Most of the hospital internship activities performed by students revolved around the usual dispensing activities (50.6%), with least or no participation in clinical pharmacy services and research activities. Consequently, least knowledge and skills were gained regarding medication management (Knowledge: $\bar{x}$=3.52, SD=1.03; Skills: $\bar{x}$=3.47, SD=1.00) and adverse drug reporting (Knowledge: $\bar{x}$=3.54, SD=1.03; Skills: $\bar{x}$=3.44, SD=1.02). The knowledge acquired by the students was more on pharmacology, something that can be acquired through a didactic approach. This is consistent with the study of Barredo and Navasca[1] which revealed that majority of the hospital interns claimed that they were not able to participate in activities involving clinical pharmacy services. These findings can be explained by two reasons. One is the unavailability of the clinical pharmacy service in the hospital. And another

is, if clinical pharmacy services are available in a given institution, these are usually solely for pharmacist or at least, for major pharmacy interns, as in the case of Philippine General Hospital. Hospital pharmacy internships normally have responsibilities related to medication preparation and distribution, since these skills are critical to pharmacy practice. However, this type of internship typically does not provide advanced learning opportunities such as performing medication management interventions, performing prospective drug use evaluations and interacting with other healthcare professionals[13]. These advanced learning opportunities are especially important because of the paradigm shift in the pharmacy profession. Pharmacy, now, is the health profession that links the health sciences with chemical sciences and it is charged with ensuring the safe and effective use of pharmaceuticals. Pharmacists, therefore, are experts on drug therapy and are primary health professionals who optimize medication use to provide patients with positive health outcomes[5].

Skills ($\bar{x}$=4.15, SD=0.65) and attitude ($\bar{x}$=4.47, SD=0.67) scores in communication resulted higher primarily due to more contact time with other pharmacists and patients. According to Kairuz and colleagues[9], professional behaviour and interpersonal skills are essential for an all-round competence in health professions. And since patient counselling are becoming one of the defined roles of pharmacist, and with pharmacist being a member of the healthcare team, communication skills are of ever- increasing importance. It can also be observed from the results that mean score on skills in decision-making was low. These activities in decision-making should be one of the primary responsibilities of pharmacist or preceptor and should be conducted to prepare students in the real practice setting[11] and in the coming changes of the profession brought about by globalization.

Despite limitations in activities, perceived positive internship experience ($\bar{x}$=4.17, SD=0.70) and high level of satisfaction ($\bar{x}$=4.11, SD=0.95) may be due to the exposure of students to a new environment[12]. Having the chance to interact with patients more often may also contribute to the positive feedback of the students. It is significant to note, however, that students may have limited perception and expectation regarding the practice of the profession in the hospital setting. With the shift of the pharmacy profession to a more patient-oriented practice, it is vital in the education of the students to include clinical pharmacy, not only through didactics but also through experiential education. Hospitals should also adapt these clinical pharmacy services, not only to cater the pharmacy students and the profession, but also for a more effective health outcome of the patients.

From the analysis of association between variables, the internship activities have impact on the hospital pharmacy internship program (p=0.00, α=0.05). It was found out that internship activities, and consequently, experience provide learning situation for students. However, more involvement of the students in the activities, especially in cases and in research, can facilitate more learning[15] and this must be noted by concerned authorities. Furthermore, the training and practice opportunities provided during the internship year are seen as valuable resource in developing the knowledge and skills acquired during the undergraduate education in achieving preparedness for eventual practice in the real-life setting[11]. Internship experience is considered as the pinnacle of students' academic experience and proves to be an excellent transition into the work world[6]. It is then important to train and equip students with skills and knowledge required for professional practice, avoiding frustration and discontent with the profession[11].

Several limitations of this study are noteworthy. First, the students included in the study were asked to recall their internship experience eight to nine months ago. It is possible that some individuals may have had difficulty in recalling their beliefs and values of six to ten months earlier[2]. Also, findings of the study may not be representative of all interns from all pharmacy schools in the Philippines, especially that the data collection procedure employed was purposive sampling technique. Moreover, evaluation from students under non-PACOP member schools was not included. Nevertheless, pharmacy internship program is likely the same across different pharmacy schools, whether PACOP- or non-PACOP-accredited, since internship is already part of pharmacy education curriculum and a requirement prior to licensing examination.

Generally, students perceived to have gained learning outcomes toward the internship program. It is, however, significant to

note that most of the learning outcomes gained by the students revolved around the technical and usual dispensing roles of pharmacists. Training on the provision of pharmaceutical care and pharmaceutical research activities, which are current trends in the pharmacy profession, were lacking in the internship program. Since internship activities were found to be significantly correlated with internship experience and learning outcomes, key players for the improvement of pharmacy education and profession must target areas where students lack involvement and expertise. Rotation to different areas and involvement to more patient-oriented activities and research activities must be included in the list of program students must experience. With the paradigm shift of pharmacy profession, an internship program designed to engage interns in activities related to clinical practice and scientific learning is highly recommended. Because only the perception of students on internship was evaluated, it is recommended to study the perceptions of internship preceptors about the internship program. A periodic evaluation of internship program is also recommended to enable concerned institutions to improve and adjust their respective courses to students and to the demands of the pharmacy profession.

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AUTHORS' CONTRIBUTIONS

Authors contributed equally to all aspects of the study.

PEER REVIEW

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests.