



## SPECIAL ARTICLE

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# Outcomes of a Pharmacy Internship Program at a Quaternary Care Hospital

## Resultados de un programa de prácticas de farmacia en un hospital terciario de referencia

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## Abstract

**Objective:** To design, implement, and evaluate a Hospital-based Pharmacy Internship Program that meets the educational requirements of pharmacy graduates to register as competent pharmacists in the United Arab Emirates.

**Method:** The Pharmacy Internship Program was designed as a 6-month, full-time, competency-based program. Intern performance was assessed through monthly continuous evaluations. Interns who successfully completed the program were eligible to take the Department of Health Licensing Examination. Pharmacy intern surveys were collected to assess their overall satisfaction with the program.

**Results:** Over the previous 5 years, the program has trained 53 interns. All interns completed the 6-month training program. Of the 53 graduates, 45 completed the post-internship survey. Interns reported a high level of satisfaction with the program structure and content.

**Conclusions:** The Pharmacy Internship Program structure was successful in its first 5 years of implementation and was both feasible and sustainable. The program was viewed as highly beneficial for the professional and personal growth of pharmacy interns and provided them with the necessary competencies and skills to successfully enter the workforce.

## Resumen

**Objetivo:** Diseñar, implementar y evaluar un programa de prácticas de farmacia dentro de un hospital que cumpliera con los requisitos formativos de los graduados en farmacia y les permitiera posteriormente acceder al examen de licencia para ejercer como farmacéuticos en los Emiratos Árabes Unidos.

**Método:** El programa de prácticas de farmacia fue diseñado como un programa de 6 meses, a tiempo completo, y enfocado a la adquisición de competencias. El desempeño de los participantes se evaluó minuciosamente mediante un método de evaluación continua mensual. Los participantes que completaron con éxito el programa podían presentarse al Examen del Departamento de Salud (examen de licencia) para obtener la licencia de farmacéutico. Se realizaron encuestas a los participantes del programa para evaluar su satisfacción general con el mismo.

**Resultados:** El programa ha capacitado a 53 participantes en los últimos 5 años. Todos los participantes completaron el programa de prácticas de 6 meses. De los 53 graduados que participaron, 45 completaron la encuesta sobre el programa de prácticas. Los participantes manifestaron una gran satisfacción con el formato y el contenido del programa.

**Conclusiones:** La estructura del programa de prácticas en farmacia hospitalaria fue un éxito en sus primeros 5 años de existencia y resultó ser viable y sostenible. El programa se consideró altamente beneficioso para el crecimiento profesional y personal de los participantes y les proporcionó las competencias y habilidades necesarias para incorporarse con éxito al mundo laboral.

## KEYWORDS

Pharmacy; Internship; Hospital-based.

## PALABRAS CLAVE

Farmacia; Programa de prácticas; Con base en el hospital.



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## Introduction

In 1992, pharmacy education began in the United Arab Emirates (UAE) with the foundation of the first College of Pharmacy<sup>1</sup>. Since then, there has been an increase in the number of pharmacy programs in the country with eight programs offering the Bachelor's Degree in Pharmacy (BSc. Pharm) and three programs offering the Doctor in Pharmacy Degree (PharmD)<sup>2</sup>. In addition to undergraduate programs, several colleges now offer the Master of Science in Clinical Pharmacy Degree, which provides students with more experience in rotations in the hospital setting as well as experience in research methods and principles<sup>2</sup>. Despite the increased numbers of pharmacy programs in the UAE, hospital pharmacy practice is still evolving<sup>3</sup>. Pharmacy curriculums are not standardized across the country, with the majority still offering a 4- or 5-year BSc. Pharm degree<sup>4</sup>. Academic institutions have only recently begun to offer the Doctor in Pharmacy (PharmD) program, with a focus on experiential education built into the professional program<sup>2</sup>. As a result, many institutions lack sufficient experience in hospital, community, and clinical pharmacy practice, with most programs still offering limited time in experiential education leading up to graduation<sup>4,5</sup>. Consequently, this aspect adversely impacts the practice readiness of pharmacy graduates. Recent results have demonstrated that BSc. Pharmacy graduates are less likely to be career ready than PharmD graduates<sup>6</sup>.

To close this gap and ensure that pharmacy graduates are practice ready, the Abu Dhabi Department of Health (DOH) established a post-graduate 6-month program, which can be completed in the community or hospital setting<sup>7</sup>. The 6-month internship program requires specific areas of practice to be completed to ensure that pharmacy graduates are ready to start working as professionals at the end of training. These areas of practice included pharmacy operations (receiving prescriptions, reviewing prescriptions, dispensing), patient care (patient interviewing, medication education, drug-drug interaction resolution), drug information, business management (understanding inventory and financial management in the practice), medication safety and quality, pharmacy federal law, and insurance issues<sup>7</sup>. Once interns complete this training period they are eligible to take for the Department of Health Licensing Examination (LE) and obtain their licence to practice as a pharmacist in Abu Dhabi (UAE). We describe our experience in implementing a pharmacy internship program in the UAE and describe the program outcomes.

## Methods

The pharmacy internship program was implemented at a multi-specialty quaternary care facility, which is a unique extension of a US-based institution in Abu Dhabi. This institution is a 360-bed hospital with state-of-the-art technology and is recognized as being Joint Commission International (JCI) and Magnet accredited and having Healthcare Information and Management Systems Society (HIMSS) level 7 certification. The institution is also the only Accreditation Council for Pharmacy Education (ACPE) provider in the country and currently offers a Post-graduate Year One (PGY1) pharmacy residency program with full accreditation status through the American Society of Health-System Pharmacists (ASHP). The department also hosts pharmacy trainees at various stages of their career, offering college of pharmacy student placements, clinical observership programs, and research observership programs for undergraduate and post-graduate pharmacy trainees.

## Program Design and Structure

The core competencies covered during the internship period were in line with the entry-level competencies needed for Hospital/Health-Systems Pharmacy Practice required by the ASHP and ACPE, the entry-level competencies needed for Ambulatory Care Practice required by the ASHP, and the entry-level competencies needed for Community Pharmacy Practice, which was based on the work of a joint NACDS Foundation-NCPA-ACPE Task Force<sup>8-10</sup>.

The program was structured to provide both clinical and operational experience of pharmacy practice. On average, around 60% of the pharmacy internship program was devoted to technical skills and learning medication use policies and distribution functions. The main emphases included safe medication practices in the drug distribution system, sterile compoun-

ding services, controlled medication distribution, and medication management and use policies.

Around 40% of the program was devoted to clinical practice. Interns had to complete five core rotations during the internship program, which included the following aspects: Medication Safety and Quality, Automation and Informatics, Inpatient Pharmacy Practice, Unit Based Pharmacy Practice, and Ambulatory Pharmacy Practice. The last rotation of the program was an elective rotation in which interns could choose from a variety of pharmacy specialty areas including but not limited to Transplant Pharmacotherapy, Cardiology, Infectious Diseases, Critical Care, Nephrology, Emergency Medicine, and Endocrinology. Interns were also required to complete specific requirements such as presenting clinical case presentations, journal club presentations, as well as attending Clinical Grand Rounds and Continuing Education seminars.

At the start of the program, all interns underwent orientation to the program requirements and structure and were provided with full details of the learning experience for each rotation describing the rotation competencies, required projects, reading material, and rotation evaluation structure. Interns had to complete a self-evaluation after each rotation and their preceptors provided a final evaluation at the end of each rotation. Interns also had to submit a preceptor evaluation at the end of each rotation, which provided continuous feedback to ensure consistent quality in delivering the program. Interns had to attend for 40 hours per week, which they could do between 8:00 am and 5:00 pm from Sunday to Thursday. Although the program was initially offered for free to interns, over time a nominal fee was charged to interns joining the program to offset its operational costs.

Table 1 provides a summary of the activities interns were involved in during the internship training period. Because interns are not licensed to practice they could not dispense medications. Although they were given access to the institution's electronic medical record (EMR), access was limited to functions that pharmacy interns are allowed to perform as stipulated by the health regulator.

Interns also had to complete an independent project (i.e. a medication use evaluation or a research project). Based on the specific topic of interest, a research advisor was assigned to help the guide process of developing the research topic and research protocol, obtaining Institutional Review Board (IRB) approval, collecting and analysing the data, and developing an abstract or a manuscript acceptable for publication.

Preceptors appointed to train interns had to meet departmental eligibility criteria. In addition, an annual review of the preceptors' professional development portfolios was conducted to ensure continuous compliance with the eligibility criteria for re-appointment. Preceptor development was offered through periodic accredited continuous education seminars.

## Intern Eligibility and Selection

Students who had completed a BSc. in Pharmacy or a PharmD could apply to the program in December or June each year, and two groups started in March and September each year. Eligible candidates were interviewed by pharmacy preceptors and the pharmacy leadership team to assess their eligibility to join the program prior to being accepted. The pharmacy internship program was offered in 2017 and the first groups of 3 interns were enrolled. The program initially started with around 8 to 12 interns per year. Over time, the program quickly grew with intakes of between 15 and 20 interns per year.

At the end of the program, interns were given an electronic survey to assess the quality of the program and request their feedback on areas of improvement. The survey was voluntary and responses were anonymous. Once interns graduated from the program they could take the LE and, if successful, obtain their licence to practice.

## Results

Over the 5-year period, 53 pharmacy students from several pharmacy colleges in the UAE were accepted into the program. All interns completed the 6-month training program and no interns withdrew or were dismissed from the program. In total, 43 (81%) interns were involved in research projects and 10 (19%) were involved in a medication use evaluation project. Pharmacy interns quickly became an integral part of the pharmacy operations covering 0.5 FTE of a pharmacy technician in ambulatory settings and

**Table 1.** Examples of Daily Activities Performed by Pharmacy Interns in Several Areas of the Pharmacy Department

| Inpatient Pharmacy/<br>Unit Based Pharmacy Services                                | Ambulatory Pharmacy Services  | Pharmacotherapy Services   |
|--|---|--|
| Barcoding medications  | Preparing medications for dispensing  | Reviewing the patients' medication profiles to optimize therapy                          |
| Packaging medications  | Receiving prescriptions from patients   | Participating in multidisciplinary team rounds with healthcare providers                 |
| Replenishing automated medication dispensing cabinets ( <i>under supervision</i> ) | Facilitating medication insurance authorization   | Recommending medication therapy changes to the preceptor based on patient profile review |
| Collecting medication histories from patients ( <i>under supervision</i> )         | Facilitating the medication delivery process (receiving calls, initiating the medication dispensing process for refill medications) | Preparing a consultation note ( <i>under supervision</i> )                               |
| Reviewing the patients' medication profiles to optimize therapy                    |   | Preparing responses to drug information requests   |
| Participating in multidisciplinary team rounds with healthcare providers           |   |  |

0.5 FTE of a pharmacy technician in inpatient settings. Since completing the program, 19% (10/53) of the pharmacy interns continued to work in the pharmacy department, 40% (21/53) are currently in practice in hospitals/healthcare institutions, 8% (4/53) have entered pharmacy residency training, and 9% (5/53) are pursuing higher education (MSc. or PhD degrees).

Table 2 shows the outcomes of the post-internship survey. It was completed by 85% (45/53) of the pharmacy interns and in general showed a high level of satisfaction with the program. The average weighted score was 4.6 on a scale from 1 to 5. In total, 98% and 100% of interns strongly agreed with or agreed with the items "willingness to work for the organization again" and "recommending the organization to other colleagues", respectively. These results show that the interns found the learning environment and professional development to have been positive during their training

period. In addition, 89% (40/45) of interns felt that they were well prepared to join the pharmacy internship program. Additionally, 51% (23/45) felt that additional focus in their undergraduate education on clinical pharmacy practice, as well as soft skills (such as communication, stress management, and time management) would make them more prepared to join a pharmacy internship. Interns provided excellent feedback on the design and structure of the program, as well as information on areas for improvement, which was used to improve the program over time. Some changes that resulted from the post-internship surveys was the addition of an automation, informatics rotation (required), financial management/pharmacy inventory rotation (elective), and unit-based pharmacy rotation. Another area of improvement noted was the restrictions placed on pharmacy interns to independently perform certain functions, such as verifying medication orders,

**Table 2.** Summary of Post-Internship Survey Results: Perceptions of the Pharmacy Internship Program

| Statement  | Strongly Agree or Agree (%) | Neutral (%) | Strongly Disagree or Disagree (%) | Mean Level of Agreement* (n = 45) |
|--|-----------------------------|-------------|-----------------------------------|-----------------------------------|
| Orientation to the Pharmacy Department was optimal                                     | 95.6                        | 0.0         | 4.4                               | 4.8                               |
| I'm satisfied with the overall structure and design of the pharmacy internship program | 93.3                        | 2.2         | 4.4                               | 4.6                               |
| I knew what was expected of me in each rotation  | 95.6                        | 4.4         | 0.0                               | 4.8                               |
| Adequate resources were available to accomplish projects                               | 95.6                        | 0.0         | 4.4                               | 4.8                               |
| Preceptors were knowledgeable and resourceful  | 97.8                        | 0.0         | 2.2                               | 4.9                               |
| Preceptors provided a clear description of the learning experience                     | 91.0                        | 6.7         | 2.2                               | 4.5                               |
| Regular feedback was provided on my progress and abilities                             | 95.6                        | 2.2         | 2.2                               | 4.8                               |
| Efforts were made to make this a learning experience for me                            | 95.6                        | 0.0         | 4.4                               | 4.8                               |
| Preceptors assigned levels of responsibility consistent with my abilities              | 86.6                        | 8.9         | 4.4                               | 4.3                               |
| Preceptors were supportive of the agreed-upon work days and times                      | 95.6                        | 2.2         | 2.2                               | 4.8                               |
| This experience helped me to achieve my career goals                                   | 95.5                        | 0.0         | 4.4                               | 4.8                               |
| Opportunities were provided to develop my communication skills                         | 95.5                        | 0.0         | 4.4                               | 4.8                               |
| Opportunities were provided to develop my interpersonal skills                         | 95.5                        | 0.0         | 4.4                               | 4.8                               |
| Opportunities were provided to develop my problem-solving abilities                    | 93.2                        | 2.2         | 4.4                               | 4.7                               |
| This experience helped me prepare for the workplace                                    | 98.0                        | 0.0         | 2.0                               | 4.9                               |

\*Mean scores on the Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). Results are expressed as weighted averages for all cohorts.

dispensing medications to patients, counselling patients, and performing pharmacotherapy consultations.

## Discussion

This article describes our experience of implementing a pharmacy internship program at a quaternary care facility over the past 5 years. The program trained 53 interns who later pursued PGY1 pharmacy residency programs, post-graduate pharmacy education (PhD or Master's Degrees), or employment in health-care systems pharmacy practice. In total, 19% (10/53) of our interns stayed in our organization, which is an indication of the quality of training they received and their desire to continue to be employed by the organization.

In contrast to other pharmacy internship programs, which are completed during the student's school year, our program is unique in that the training experience was provided after graduation, thus allowing interns to fully dedicate themselves to this experience<sup>11,12</sup>. This approach also provided more flexibility in helping interns to improve over time and engage in research projects, which covers 6 months of the training program. This advantage would not be achievable if the program had a different structure.

One of the key components of our program is the experience it provides in conducting research. Many residents went on to publish or present their research projects at national and international conferences. In addition to their experience in direct patient care, we believe their research experience increases their readiness to join pharmacy residency programs. Although we have not assessed the attitude of graduate interns in relation to this aspect, 8% (4/53) of our interns went on to pursue PGY1 pharmacy residency programs, which is an encouraging outcome.

Another strength of our program is the presence of highly qualified preceptors. They all meet the precepting criteria as described in the ASHP residency accreditation standards<sup>13</sup>. These require preceptors to show continuous professional development in order to maintain their status as preceptors. Preceptor development portfolios are maintained at our institution and are updated every 2 years. In order to be re-appointed, these portfolios must be maintained and preceptors must attend mandatory preceptor development seminars.

As the number of interns increased, a challenge was how preceptors would be able to provide dedicated teaching time while performing their daily clinical duties. Most of our preceptors are front-line pharmacists who are responsible for both patient care and for precepting residents, interns, and students. To address this issue, we implemented a layered learning model in the third year of the program, such that PGY1 pharmacy resi-

dents in their second year would act as co-preceptors to pharmacy interns, while the latter would also participate in precepting Introductory Pharmacy Practice Experience (IPPE) students toward the end of their internship. This approach provided our residents with an excellent learning experience, because it more effectively integrated teaching components into their residency training, while giving interns the opportunity to gain first-hand experience in training pharmacy students. Thus, the learning environment was very positive, allowing us to sustain our training programs without compromising patient care. Our experience was also in line with previous research on layered learning models in pharmacy education and their positive outcomes in patient care<sup>14,15</sup>.

Another challenge is that pharmacy interns in the UAE are not allowed to dispense medications, directly counsel patients, compound sterile preparations, or perform medication reconciliation. These activities are routinely performed by pharmacy interns under the direct supervision of qualified preceptors in countries such as the United States, United Kingdom, and Australia<sup>16,17</sup>. This aspect is a hindrance to obtaining the full benefit of internship because mastering many of these activities requires "hands-on experience", which cannot be achieved through observation alone. It also mainly limits the tasks performed by interns to various types of technical activities, and is thus not congruent with the aims of their undergraduate education. We plan to review the scope of practice for interns with our local health regulator such that their role can be expanded in the future.

The program trained 53 interns from January 2017 to December 2021. Interns who graduated from the program enrolled in residency training, found employment in hospital-based practice, and/or followed advanced degrees in pharmacy. The program received very favourable feedback from interns, proved to be both feasible and sustainable, and could be replicated in other institutions.

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## Conflict of interests

No conflict of interests.

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