RESEARCH

A Hospital-based Pharmacy Internship Program in Jordan

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Objective. To develop a hospital-based pharmacy internship program in a comprehensive cancer care center in Jordan and review its outcomes over a 10-year period.

Methods. King Hussein Cancer Center developed a two-year internship program for pharmacy students in Jordanian universities. The program included training in operational and clinical settings during the academic year and school holidays. In addition, the students completed rotation-related assignments and met weekly with the program director. During the rotations and at the end of the program, interns were asked to assess their level of satisfaction with the program and to comment on its content and structure.

Results. From a pilot phase with only three interns and a simple training structure, the two-year internship program has become more structured now training six interns annually. During the first 10 years of the program, 51 students from four universities in Jordan enrolled in the program, with six current interns, 34 graduates, and 11 withdrawals. Graduates reported improved academic performance and satisfaction with the program's structure and the skills obtained. Their main challenge was time management during the academic year.

Conclusion. A hospital-based pharmacy internship program is feasible and sustainable. Participation in the program improves interns' academic performance and clinical and professional skills, despite the challenges of highly demanding conditions on both the hospital and the students.

Keywords: pharmacy, internship, hospital-based

INTRODUCTION

Pharmacy education in Jordan started when the first college of pharmacy enrolled its first cohort about four decades ago. Currently, 15 universities in Jordan offer a five-year bachelor of science (BSc) in pharmacy, and two offer a six-year doctor of pharmacy (PharmD) degree. The BSc program requires completion of 160 credit hours and 1440 training hours in community and hospital pharmacies. The PharmD program requires completion of 219 credit hours. The sixth year of the program is the experiential year, during which students spend 14 weeks in community and hospital pharmacies, followed by five consecutive six-week rotations in various medical specialties.¹

In addition to the BSc and PharmD programs, several pharmacy schools offer postgraduate degrees such as master of science (MSc) degrees in pharmaceutical sciences, clinical pharmacy, and/or drug design, and a

doctor of philosophy (PhD) degree in pharmaceutical sciences.²

Despite these structured programs, pharmacy graduates with a BSc or PharmD degree are considered unprepared to practice in most pharmacy-related settings.² Similar observations have been made by others in the Middle East.^{3,4} Pharmaceutical care and the involvement of pharmacists in clinical decisions are not emphasized enough in the educational curricula and are not widely accepted or acknowledged socially in Jordan, as in most of the region.^{3,5} This is attributed primarily to curricula, which is traditionally science focused and theory based.^{3,5} A study published in 2008 reported that the pharmacy curricula in Jordanian universities have a significantly low number of hours allocated to pharmacology and pharmaceutical care topics, with the highest being one-fifth of the total curricular hours.⁶ Though we realize that the curricula in all Jordanian universities have been modified over the past several years, the credit hours for pharmaceutical care topics are still considered insufficient and less than those allocated to general sciences, pharmaceuticals, and medicinal chemistry. In addition, most of faculty

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members at schools of pharmacy are not practitioners, and this often results in a gap between the needs and challenges of the real world and the education and training offered.^{3,5} Also, graduate pharmacists in Jordan are generally unaware of the existing pharmacy sectors and pharmacists' roles in various settings, and therefore usually lack a career direction.³

The gap between the curricula and practice was apparent when pharmacy graduates were hired at King Hussein Cancer Center (KHCC). The pharmacists were not fully aware of the nature of practice in a clinical or hospital setting and did not have the necessary skills or knowledge to perform essential tasks such as sterile compounding, effective patient counseling, and providing drug information. Therefore, the pharmacy department at KHCC decided to develop an in-hospital internship program to improve students' skills in hospital pharmacy practice and to increase their awareness of their roles and responsibilities. We describe the development and implementation of a hospital-based pharmacy internship program and highlight outcomes over the 10 years since inception.

METHODS

A pharmacy internship program was developed and implemented at KHCC, a 170-bed comprehensive cancer center in Amman, Jordan. KHCC is the only specialized cancer center in Jordan, serving over 3500 Jordanian and non-Jordanian cancer patients annually. The pharmacy department at KHCC has over 80 pharmacists and pharmacy technicians who provide patient-centered pharmaceutical care for inpatients and outpatients.

The program started with a pilot phase in 2005 during which the pharmacy department created three part-time intern positions for a two-year internship program. Students eligible to apply were those who had completed three or more years in an accredited pharmacy school in Jordan in either a PharmD or BSc program. This three-year period was required since students are not introduced to basic pharmaceutical and clinical training until the beginning of their third year (the first two years mainly cover general science). There were no other eligibility criteria.

The interns were hired as KHCC employees and received a fixed monthly stipend. They started the program with the general orientation given to all hospital employees. They were required to work for 12 hours per week (mostly weekends) during the academic year and 35 hours per week during their summer and winter holidays. Training during the pilot phase of the program was primarily in operational pharmacy, with interns rotating between the hospital's inpatient and outpatient pharmacies. During their rotations, the interns performed all the

tasks of a pharmacy technician and observed the practice of pharmacists during order processing, clarifications, interventions, drug information, and patient counseling. During the program's pilot phase, the clinical section was in its early stages of development; therefore, the interns had only one rotation in this area in the second year of their internship.

After the two-year pilot phase, pharmacy administration approved the internship as an official training program offered by the pharmacy department and assigned a senior pharmacist as program director. At that point, the eligibility criteria were modified, and the program was structured to include both operational and clinical rotations. The program was initially promoted by word of mouth, but later was advertised during pharmacy career days at schools of pharmacy. Over the 10 years since its inception, the program has expanded to include 12 intern positions at any one time, with the goal of having six interns in each internship year.

Students apply for the program by submitting an application form listing their educational and employment history. The eligibility criteria were modified to include an assessment period, which was typically conducted during the summer holiday. Applicants spent two months in one of the hospital pharmacies where they were assigned to a preceptor who provided training in operational pharmacy and supervised them in technician-related tasks. The students were assessed by the preceptors, who evaluated their professionalism, ability to commit to the work schedule and assigned tasks, and their level of interest in advancing their knowledge and skills.

The first year of the internship program included only operational rotations, while the second included both operational and clinical rotations (Table 1). At the operational level, the interns were expected to cover technician shifts within their set schedules, so they were trained in all the technician-related tasks in the inpatient and outpatient pharmacies except those tasks related to chemotherapy and sterile product preparation. The interns assisted in busy pharmacies throughout the center and performed the duties of staff technicians when those employees were out for holidays and short-term vacations.

The interns' clinical rotations were scheduled during their summer and winter holidays to allow them to attend daily rounds and observe all activities of the clinical pharmacist. The clinical pharmacists were asked to be available during the interns' winter and summer holidays to determine the available clinical rotations. The interns could express their service preference; however, they were encouraged to start with a general service such as pediatrics or internal medicine for their first rotation and move on to more specialized units such as intensive care and bone marrow transplant for later rotations.

Table 1. Operational and Clinical Rotations Completed by Students Enrolled in a Pharmacy Internship Program at a Major Cancer Treatment Center

Component	Operational Rotations	Clinical Rotations
Service	In-patient pharmacy Sterile preparations pharmacy Adult outpatient pharmacy Pediatric outpatient pharmacy	Internal Medicine Outpatient chemotherapy Critical care Bone-marrow transplant Leukemia Palliative Surgery Pediatrics
Hours requirement	12 hr/wk – school semester 35 hr/wk – school holiday	Inpatient services: 2-3 weeks Outpatient services: 1 week
Minimum requirement	13 weeks' service in each pharmacy (one school semester)	Two inpatient services + one outpatient chemotherapy service
Requirements and expected outcomes	Daily technician tasks: Receiving prescriptions Filling medication orders Receiving medication stocks Extemporaneous preparations Shadowing and observation of pharmacists' work during: Patient counseling Management of clinical and nonclinical patient complaints Patient profile review clinical interventions	Shadowing clinical pharmacist on the service Attending physician rounds Service-related reading material Review of patient profiles Medication reconciliation Comprehensive clinical assessment by case discussions with preceptor Input on patient care plan to preceptor One case presentation per rotation Data collection, analysis, and entry for pharmacy-related research, when feasible
Sessions with program director	Weekly group discussions One-on-one as needed	After each clinical rotation
Assessment	After each rotation and at the end of each year.	After each clinical rotation

Throughout the program, weekly sessions were held during which the program director met with the interns to discuss the operational and clinical aspects of pharmacy. Many interns chose to discuss topics related to their daily practice and observations at KHCC and to link them to what they learned at school or observed at other practice sites. Interns were required to complete assignments related to their practice in the operations section, which were discussed with the group in subsequent sessions. After completion of each clinical rotation, each intern was asked to present a case or clinical topic that he/she had encountered during that rotation. The interns' presentation skills, choice of topic, and clinical content were analyzed and discussed within the group.

As the department's vision and capacity evolved, research became an integral part of its focus and strategic goals, and a research training program was developed.⁷ This in turn created opportunities for those interns interested in research. When feasible, interns who were interested in research were matched with a clinical preceptor who was actively conducting research and could involve the intern in the project, usually

in data collection. However, involvement in the research project did not excuse the intern from completing their required rotations. Therefore, the research-related activities were typically performed along with the interns' ongoing rotations. Thus, the expectations of and time-commitment by the intern had to be tailored based on their other core rotations.

At the end of each training year, when interns had completed their rotations, the program director met with the trainees to obtain their feedback. Interns were asked to provide feedback regarding the program; their own evaluation of their abilities; the program's impact on their knowledge, skills and professionalism; the difficulties they were facing; workload; and the program flow and content. Their input was used to further improve the internship schedule and content. Advisory one-on-one sessions were held between the students and the program director as needed. No formal survey was conducted to measure program outcomes.

RESULTS

Over the 10-year period, 51 pharmacy students from four universities in Jordan enrolled in the program. Of the

interns enrolled, 34 graduated from the program, 11 withdrew, and six were completing their internship at the time this study was completed. Withdrawal from the program was primarily due to conflicts between the student's pharmacy school schedule and their internship schedule or inability to manage the workload of the internship on top of their school requirements, which included curricular training hours. Nine interns were involved in research projects, mainly by assisting with data collection.

Through the internship program, pharmacy students experienced their first encounter with regulations, policies, and procedures, as well as the roles and responsibilities within a professional work setting. Each intern was able to cover one-fourth of a technician's full-time equivalent (FTE) responsibilities during the school semesters and three-fourths during school holidays.

Over the 10-year period, the pharmacy department hired 20 (59%) of graduates from the internship program, 10 of whom are still KHCC employees. Among the graduates, seven (20%) interns are currently practicing in other hospitals, while six (18%) have pursued higher education (MS or PhD degree) in pharmaceutical or clinical research fields.

During group discussions and one-on-one sessions, the graduates reported that they were satisfied with the structure of the program and the learning experience, but reported difficulty in meeting their commitment when they had classes. They reported that their skills and knowledge had increased significantly during their internship and that their academic performance had improved after the internship.

DISCUSSION

This hospital-based pharmacy internship program developed and implemented in a major cancer institution in Jordan enrolled more than 50 pharmacy students over the past 10 years. The program is unique in that it provides students with longitudinal experience, is conducted at a single center, and is not part of a school curriculum. Several other hospital-based internship programs have been described, but the majority were conducted during students' summer break rather than over two years.⁸⁻¹³ Longitudinal programs are expected to provide students with a more effective learning experience than those limited to a few months.^{8,11} Nevertheless, during the academic year students' internship commitments were sometimes a challenge. One of the marked strengths of the program is that it is conducted in a single institution, which helps to familiarize interns with the center's policies, procedures, and standards, and increases their contribution to operations as they gain new skills and build on them. Relocation of trainees

is considered labor-intensive and time- and cost-consuming.¹⁴

Another empowering aspect of the program was the practice site, which has established policies and procedures and strong pharmacy input in overall medication management. The interns' interactions within a medical team helped to develop their use of evidence-based interventions and critical thinking. Recognition that such a service is possible and can be expanded helped to build the potential of the interns as future pharmaceutical care providers in Jordan and elsewhere. This is significant, considering that the implementation of the pharmaceutical care concept faces many challenges in the Middle East, and the role of the pharmacists is still generally viewed as limited mainly to inventory management and drug dispensing.^{3,15-19}

The cooperation and involvement of the pharmacy department team helped shaped the interns' professional experience. The pharmacy team provided the interns with the support and mentorship for them to learn their roles and responsibilities at a professional work site and for them to understand the work-related regulations, policies and procedures. The internship preceptors in the program had no structured training in precepting and their performance and skills were not evaluated. In the future, we are planning to conduct training sessions for and evaluations of new preceptors. The importance of preceptor training and continuous education to ensure preceptors have the necessary teaching tools and skills has been reported elsewhere.^{20,21}

The caliber of graduates from the program and the impact the internship had on their time management ability reflected positively on students' academic achievement and further promoted the program to other students, as reported in their end-of-program assessment, when they were asked to describe their experience. The feedback received from interns and pharmacy team members was used to further improve the program throughout the decade. Others have reported measuring outcomes using formal or informal surveys, written evaluations, reflection notebooks, regular internal follow-up including feedback from students and preceptors, and specific quality assurance studies.^{9,14,20-23} We acknowledge the absence of these types of formal evaluation as a weakness of our program and are creating more structured tools for assessing interns' performance and satisfaction in the future.

Despite the program's sustainability over the past 10 years and the positive feedback received, several challenges were encountered during implementation. Promoting the new concept of a long-term, demanding commitment to training among students was and remains a common challenge. Students' busy schedules, which

include curricular training, were a major reason for the reluctance of many students to apply to the program. Although the hospital is not affiliated with any pharmacy schools, the issues raised by students will be discussed with academic representatives in order to identify strategies to ensure that students can commit to such a program without affecting other curricular requirements.

The highly demanding work conditions within the pharmacy department present another challenge. The responsibilities of preceptors and the pharmacy team in guiding, training, and supervising the interns, in addition to their daily tasks, placed extra strain on these individuals. To address the time limitations within operational and clinical settings and to maximize the benefits of the program, periodic group discussions were held with the interns to give them space to address issues that required lengthy explanation, whether related to clinical topics, professional behavior, patient cases, or any other topic that could not be discussed comprehensively on site. Many approaches to overcoming this problem have been reported in the literature, including implementing peer-assisted or near-peer training in which senior interns participate in training junior interns,^{11,14} and use of preceptors from other disciplines such as nursing and medicine.^{14,21}

The contribution of the department of pharmacy to research was limited during the first five years of the internship program. In 2010, a structured pharmacy research training program was initiated that increased the number of research projects in the department,⁷ providing more opportunities for all staff members, including interns, to participate in structured research projects. However, the busy schedules of the interns limited their contributions, and they were involved mainly in data collection for the research teams. As the pharmacy research program expands, research may be added as an elective within the internship program, with a clear structure and learning objectives that would provide a valuable learning experience for the interns.

In spite of the interns' busy schedules, having at least five interns at a time provided coverage of a minimum of 1 FTE during school semesters and 4 FTEs during school holidays. This in turn helped in the coverage of technicians' vacations and shifts during national holidays and alleviated workload on busy days. This contribution supported the program's feasibility and sustainability within the center at the administrative level.

CONCLUSION

The successful implementation and expansion over 10 years of a hospital-based pharmacy internship program in a comprehensive cancer care center suggests that

such an undertaking is feasible and sustainable. Students and faculty members reported positive outcomes on the interns' academic performance as well as their clinical and professional skills. The major challenges encountered included a heavier workload, the demanding conditions on both hospital staff and students, and the students' busy school schedules.

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