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Design, Development, and Early Implementation of the Professional Pharmacy Curriculum in Iraqi Kurdistan

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Abstract

Due to 30 years of war and trade sanctions, critical gaps in the higher education system in Iraqi Kurdistan have developed. In recognition of the need for curricular change, the Kurdistan Ministry of Higher Education (KMoHE) worked with U.S. universities in 2008 to update various curricula including pharmacy. A pharmacy curriculum reform committee was formed and charged with identifying current and future needs of pharmacy practice and education, evaluating the current curriculum, recommending curricular change, and identifying needs to implement the new curriculum. The curricular changes recommended by the committee were accepted by the Minister of Higher Education and have been implemented in all three pharmacy programs in Iraqi Kurdistan. Faculty development to assist with delivery of the curriculum has been successful and continued support is provided.

Keywords

Iraq; Kurdistan; Pharmacy Education; Doctor of Pharmacy; Curriculum

Background

Kurdistan is an extensive area in the Middle East covering areas in Turkey, northern Iraq, northwestern Iran and parts of southern Syria. Small areas of Azerbaijan and Armenia are also considered to be a part of Kurdistan. The Iraqi government subjected ethnic Kurds to forced displacement and assimilation for decades, and from 1986 to 1989, genocide under the Baathist regime. Iraqi Kurdistan has gained official recognition as an autonomous federal entity established by Article 113 of the Iraqi constitution. The Kurdish Regional Government (KRG) includes three provinces, Duhok, Erbil and Sulimani has been under self-rule since 1992.

Kurdistan Healthcare System

Within Iraq there are two ministries of health (MoH), the Federal Ministry of Health in Baghdad and the Regional Ministry of Health in Erbil, Kurdistan (Kurdish MoH). The Kurdish MoH is further divided into 19 provincial departments of health and is accountable to Kurdistan's parliament, the National Assembly. Despite responsibility to the KRG, the Kurdistan treasury is funded from the Iraqi treasury, and transfer of funds from Iraq to Kurdistan is not reliable and has been insufficient for the region's needs [1].

Concern has been expressed that no "system" is in place and that physician services are offered by many practitioners, some of who are unqualified, unlicensed, or both. Public hospitals and public primary care centers are available but often overused for minor illnesses and return visits due to lack of trust of healthcare professionals. The public primary care centers are often viewed as referral stops; patients present to the clinic only desiring referral to the hospital or a specialist. In some cases, the clinic physician may refer the patient to his private clinic. In addition to an unenforced referral system, prescribing often complies with a patient request.

Brand-name products are widely prescribed over generic products since Western brand-name products are perceived as more effective than generics. Further complicating prescribing and medication use, prescription medications can easily be obtained from private pharmacies or street vendors selling improperly stored or expired drugs. Due to overcrowded clinics, physicians are seeing patients at a rapid rate and addressing only the most immediate concerns. Additionally, lack of access to medications limits their ability to treat chronic health issues causing public health initiatives to suffer. Within the clinic, the roles, responsibilities, and functions of staff are unclear and may lead to internal power struggles [1] In general, inter- professional working conditions may be poor, and lack of regard or respect for the role ofnurses has been reported [1-3]. Hospital record-keeping is minimal and thought to be nearly non-existent in outpatient clinics [2]. In addition, records of adverse events or complaints about medications are not maintained [1]. According

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to a 2012 interview with the Minister of Health, money has been budgeted to computerize the health-system; however, pen and paper are still beingused [3].

In a survey of medical professionals (physicians, dentists and pharmacists), seven healthcare priorities were identified: adopting a health insurance system (76.1%), periodic scientific assessment of physicians and staff (69.8%); minimizing the gap between urban and rural health services (58.2%); social insurance for medical care of the poor (82%); public-private systems separation (50.5%); better role for regional Ministry of Health and professional associations in controlling the private sector (61.5%); and enhancing the role of family medicine in the health system (77.2%) [4].

Pharmacy Practice in Kurdistan and Iraq

While healthcare in Kurdistan may seem chaotic, modern pharmacy has its earliest roots in the Middle East. The first apothecary shops in the world were established in Baghdad in 766 CE; [5-6] the world's oldest prescription was found on a Sumerian clay tablet; [6].

The first medieval school of pharmacy founded in Baghdad; [5,6] and pharmacists in Iraq were among the forerunners in developing standards for preparing and storing medicines [5]. According to one source, Mercurial ointments, mortars and pestles, flasks and spatulas, as well as evidence based pharmacotherapeutics have their roots in Arabic pharmacy [6].

In 2005, an academic pharmacist in Iraq was interviewed. He reported a "complete breakdown" in the pharmaceutical distribution system. Access to essential drugs was limited, counterfeit medications had infiltrated the market resulting in 97% of medicines of unknown quality, and an increasing number of unlicensed street vendors were selling pharmaceuticals. Additionally, prescription medications were being used for grossly inappropriate indications such as piperacillin for toothaches and quinolones for minor fever. He reported that community pharmacies had been destroyed, looted and that pharmacists and academic staff had been attacked by terrorists, murdered or kidnapped. Exacerbating the shortage of community pharmacies caused by violence, new pharmacy graduates were taking clinically-oriented jobs in hospitals instead of pursuing community practice [6].

In a follow-up interview two years later, he reported that community pharmacies were open and functioning, but hours were limited due to curfews. He continued to report escalating violence and murder of pharmacists, he also stated that professional standards were lacking and that continuing education had stopped [7]. According to a companion article written by another Kurdish pharmacist, the state of pharmacy in Kurdistan was much improved and a "unified pharmaceutical society covering the whole of the Kurdistan region" was active and effective [8]. The author stated that the removal of sanctions had improved the drug supply making nearly all drugs available. He also noted that the KRG was building a quality control unit to address illegal drug sales by unqualified personnel and that a pharmaceutical production facility was being built next to a school of pharmacy. Specifically, it was stated that insulin from Novartis was available [8]. At the same time, insulin was in shortage in other areas of Iraq but seen in the market "baking in the sun" [7].

In Iraq as a whole and the Kurdistan region, availability of drugs from unlicensed street vendors is uncontrolled [7]. And undermines the role of the community pharmacist [5]. Drugs dispensed to patients virtually free are often resold on the black market [1]. Further, drug shortages and lack of enforcement of drug regulation has made the country a "haven to counterfeit medicines and drugs of substandard quality" [5]. In a survey of medical professionals, the majority of respondents considered the "availability of required quality and quantity of medications" to be weak or very weak [4]. In 2012, the Kurdistan Minister of Health summarized the current efforts of the MoH to stop the use of counterfeit or poor quality medications in Kurdistan. In order to toughen border checks, pharmacists are inspecting medications at the border and can refuse entry of poor quality or unregulated medications. There may be as many as 4,000 illegal pharmacies in the Kurdistan region. Many are run illegally by unofficial nurses [3]. To address this issue, monitoring of private pharmacies was scheduled to start on August 1, 2012. The minister stated, …if poor quality or expired medicine is found it will be burned and the responsible party will be arrested and sentenced [3].

Pharmacy Education

A recent survey of pharmacy education in the Middle East (Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Syria, and United Arab Emirates), identified 78 schools in 13 countries [6]. The authors reported that the 2001-2004 pharmacist density (pharmacist per 1000 people) in the Middle East ranged from 0.13 in Yemen to 1.69 in Egypt. Iraq fell in the mid-range with a pharmacist density of 0.5. The pharmacist density in the and Canada were 0.88 and 0.67, respectively. In the Middle East, the pace of change in education has been rapid while overall change in pharmacy practice has been slower. Several countries are trying to reduce their dependence on expatriate pharmacists and are adding new pharmacy programs to increase local production of pharmacists. This increase in programs is causing a shortage of well-trained faculty and mentors which further hinders progress in changing curriculum when no faculty are available to teach new topics [6]. These challenges are similar to those faced by pharmacy education in Kurdistan.

In general, critical gaps have occurred in the higher education system in Kurdistan and were caused by more than 30 years of wars and embargos. During that time, no significant change or update of school of pharmacy curricula has occurred for almost 30 years. The Bachelor of Science in pharmacy curriculum is offered by all pharmacy schools in Kurdistan and Iraq [9]. The curriculum is arranged in a 0/5 lockstep method [5,6]. After graduation, completion of a "pre-registration" year is required prior to licensure [5]. According to a 2013 letter, there are 13 public and four private colleges of pharmacy in Iraq [9]. Three of these are located in the Kurdistan region. In Kurdistan, every school of pharmacy in the country teaches the same curriculum with the same syllabi at the same time and it is delivered by faculty with a Ph.D. degree. The Doctor of Pharmacy degree is not recognized as sufficient qualification to teach in higher education.

In a 2005 interview, the lack of pharmacy faculty in Iraq was reported. Causes of the shortage included assassination of 40 academics in an eight month period and the opening of five schools pharmacy in six years. Schools hired faculty who were not licensed pharmacists and concern was raised that teaching was not oriented to pharmacy practice which would contribute to the stagnation of the profession [5]. Classroom, laboratory, and library facilities are inadequate and instructional resources such as laboratory equipment, textbooks, and computer equipment remain in short supply [5,6]. In some cases, libraries could only obtain photocopies of references and texts; few or no original copies from the publisher were available [5].

The lack of academic staff in Iraq has been recognized as severe and supports the concept that fewer advanced degree pharmacist faculty has resulted in more non-pharmacists teaching courses. It has been reported that some schools have began to hire top graduates as "academic pharmacist" instructors [6]. Higher education in Iraq is free to students and they may receive extra support and incentives for their education [10]. An assessment of the demographic transition and development of Kurdistan was published in 2009. The authors stated that the education system was below international standards but noted advances in the system in the last few years. The need to strengthen policies already initiated for better and more effective education was identified as well as, on-the-job training, and health services [10].

Rationale

In order to assess the needs for pharmacy education in Kurdistan and propose a new pharmacy curriculum, a pharmacy curriculum reform committee formed to design a pharmacy curriculum that would provide students with skills and abilities they will need to address the present and future needs of Iraqi Kurdistan. The following

report describes the progress that was made in pharmacy curricular development with faculty at the Hawler-Medical University College of Pharmacy.

Materials and Methods

The Kurdistan Ministry of Higher Education and Scientific Research (KMoHE) partnered with Appalachian State University and the U.S. Department of State to re-examine and revise their curricula so that students are provided with "market ready" skills to meet the present and future needs of the country. The 10 academic disciplines identified by KMoHE for curricular review are as follows: Biology, Chemistry, Civil Engineering, Computer Sciences, Dentistry, Education, English, Family Medicine, Pharmacy, and Sociology. Five public universities under the purview of the Kurdistan Regional Government's Ministry of Higher Education and Scientific Research are involved in this project. In some cases, Appalachian State University could not provide faculty with expertise in a specific discipline. In these cases, Appalachian State University collaborated with member institutions of Tennessee Independent Colleges and Universities Association (TICUA), Belmont University, Meharry Medical University, and Tennessee Technical University, and East Tennessee State University. Table 1

Implementation of the program activities commenced in January 2009 after the formalization of the agreement between Appalachian State University and the Kurdistan Ministry of Higher Education and Scientific Research (KMoHE). At the Ministry level, a specific department was established with responsibilities for coordinating curriculum development efforts. Additionally, each university established a university committee to oversee curriculum development efforts. These university-based committees have worked closely with the U.S. faculty from academic disciplines identified previously to address curricular revisions and enhancements.

The entire curricular design process was completed at the request of the Minister of Higher Education. The pharmacy curricular reform committee was under the direction of the Dean of the Hawler School of Pharmacy, Dr. Abdulqader Aziz Alnakshabandi.

Additional committee members were the chairs of the following departments of Hawler Medical School: Pharmacology and Toxicology, Chemical Pharmaceutics, Laboratory Analysis, and Pharmacognosy; the on- site U.S. facilitator (Dr. Webster); and a U.S. assistant (Dr. Ficzere). All faculties from Hawler Medical College of Pharmacy were pharmacists with a Ph.D. degree. The on-site team met daily for up to eight hours a day, six days a week for over two weeks and followed four steps in their approach to curricular reform:

- Identify current and future needs for pharmacy practice and education
- Evaluate the current curriculum
- Recommend changes to the current curriculum
- Identify resources needed to deliver the revised curriculum

Pharmacy Practice and Education Needs

Within Kurdistan, unique needs remain within the pharmacy practice community. In the hospital setting, along with providing drug delivery services, pharmacists practice in the clinical chemistry laboratories conducting clinical laboratory tests. As hostilities in the region end, the pharmaceutical industry is growing and will employ more pharmacy practitioners in production facilities. Additionally, the committee remained sensitive to the continuing and increasing need for practitioners to fill the escalating need for Kurdish community practice pharmacists.

Curricular Evaluation

In Iraqi Kurdistan, faculties are not the generators of their own syllabi. Syllabi are generated at the council of deans' level and agreed upon for simultaneous implementation in every program in the country. The syllabi are then provided to the faculty with teaching responsibility. There were no other curricular models to review within the same country. The committee selected three doctor of pharmacy curricula against which to benchmark the current curriculum: two from the United States and one from the Kingdom of Jordan. The Kingdom of Jordan's curriculum was chosen because a committee member had experience with that curriculum and maintained contact with current faculty.

Delivering the Curriculum

With the anticipated change in curriculum, the committee re-evaluated the college of pharmacy's mission, vision and goals statements. This discussion was begun prior to the consultant visit through electronic communication. The issue of assessment was a parallel focus/discussion throughout the entire visit. The committee understood that assessment is at the heart of every academic program and discussed the following topics:

Developing an assessment plan:

- Assessing seamlessly from course through program
- Using Course assessment methods (examinations, OSCEs, group projects, papers, projects etc.)
- Using Student assessment methods including portfolios
- Mapping course objectives to department goals
- Using assessment as a tool for self-study success
- The committee also reviewed the accreditation process form the Accreditation Council for Pharmacy Education (ACPE) currently in use in the United States.

Results

Curricular Evaluation

Several major differences became immediately apparent. The original Kurdish curriculum lacked numerous contemporary courses, and there were heavy concentrations in the pharmaceutical sciences including multiple years of instruction for each of the following laboratory based courses: pharmaceutics, medicinal and pharmaceutical chemistry, and pharmacognosy. There was a dearth of courses in the pharmaceutical social and administrative sciences and a minimal number of courses in clinical pharmacy. Another major

S.no	Academic Discipline	Kurdistan Regional Government Institution	U.S. Institution
1	Biology Chemistry	University of Koya	Appalachian State University Appalachian
2	Civil Engineering	University of Salahaddin-Hawler	State University Tennessee Technical
3	Computer Sciences	University of Koya	University Appalachian State University
4	Dentistry	University of Duhok Hawler-Medical University	Meharry Medical University Appalachian
5	English	University of Salahaddin-Hawler	State University Appalachian State
6	Family Medicine	University of Duhok	University East Tennessee State University
7	General Medicine	University of Sulaimaniyah	Appalachian State University East Tennessee
8	Pharmacy	Hawler-Medical University	State University Belmont University
9	Sociology	University of Sulaimaniyah	Appalachian State University

Table 1: Kurdistan Regional Government University and United States University Partners by Academic Discipline

observation was that the curriculum was arranged on an annual course system. By not being semester based, the curriculum lacked the flexibility afforded by a semester basedapproach.

Recommended Curricular Change

The committee revised the mission and vision statements to incorporate a focus on clinical and evidence based practice. The committee revised the Bachelor of Science program and added the Doctor of Pharmacy degree. The goal with the two degree tracks is to produce pharmacy graduates who will continue to fill the current need for community pharmacists and clinical laboratory specialists while offering students the opportunity to pursue clinical pharmacy practice. In the new curriculum, all students take the same courses for the first nine semesters. Laboratory credit hours were significantly reduced (46%) and didactic clinical coursework was increased 9.5-fold. A breakdown of the changes in the credit hour allocations for the proposed curriculum can be seen in Table 2. In the tenth semester, the degree programs diverge.

Students in the Bachelor of Science program take laboratory courses and practice rotations to support the requirements for community, industrial and clinical laboratory practice prior to graduating. Doctor of Pharmacy students take advanced clinical coursework in pharmacokinetics, therapeutics, epidemiology, drug information and nutrition. This is then followed by ten one-month clinical rotations in the sixth year prior to graduation. (Appendix A)

Delivering the Curriculum

The committee examined faculty distribution needed for the new curriculum along with needed facilities at the institution and at experiential sites. The committee was required to obtain benchmark syllabi for each course in the proposed curriculum. Discussion also ensued on the need to develop department chairs for future administrative roles, development of junior faculty for chair positions, and mentoring faculty in teaching and student relations. With a significant emphasis on library holdings and access, the committee began a plan for the introduction of a drug information center within the college of pharmacy in the future.

Additionally, student progression and program rigor were discussed. Different options were examined and a thorough review will be performed by the college committee. The proposal was modified and details for implementation were finalized during three meetings of the Kurdish council of deans. Finally, it was accepted at Hawler-Medical University and at all three pharmacy schools in Iraqi Kurdistan: Hawler Medical University, University of Duhok, and University of Sulaimaniyah.

Discussion

Agreeing on the move from annual course offerings to a semester approach provided us more flexibility in the curriculum design process. With this change, the committee was able to keep about 60% of the old curriculum, if in name only, to soften the perception of change. The course names that did not change are identified in Appendix A. With revision needed for the entire curriculum, retaining course names but updating content was more easily accepted than recreating all new courses. Obtaining benchmark syllabi was a useful component in order for the deans to accept change. The ability of the consultant to provide the committee information and suggestions and then step back and let the committee have time to discuss and modify the consultant's input was essential. The Kurdish members of the committee had greater confidence in the process and greater ownership of the final product. Ultimately, the support and direction of the Minister of Higher Education and the passion, drive, and commitment of Dr.Alnakshabandi, Dean of the Hawler Medical School were crucial to the successful functioning of the committee and acceptance of the committee's recommendations. With no change to the curriculum in 30 years, updating of all courses was a requirement.

Depth of content in basic sciences courses had to be reduced and in many cases laboratory requirements were completely removed from some courses. The curricular revision committee encountered significant resistance to change from faculty. In many cases, faculty had been teaching the same courses in the same manner for many years. While resistance was met, younger faculty was more ready to accept change. In order to deliver the new curriculum, the curricular revision committee recognized the need for faculty development. In a 2012 article, the teaching staff at the Medical College at Hawler Medical University identified the following priorities for medical education: improving quality of teaching including use of small group teaching strategies in all study years; improving infrastructure and facilities for teaching; providing continuous academic development programs for teaching staff [11]. While pharmacy education is not specifically addressed, this article does indicate interest in improving healthcare professional education.

The relationship between Belmont University College of Pharmacy and Hawler-Medical University that began in 2008 has continued. Because current faculty are now faced with teaching subjects or courses that they have not experienced or taught previously. Belmont and Hawler-Medical developed a training program for current faculty to gain experience in drug information and clinical pharmacy education. Faculty training includes drug information practice, institutional and clinical practice, and classroom clinical pharmacy instruction in topics such as therapeutics. The most difficult topics to teach are pharmacy administration and pharmacoeconomics. Common Western business practices and banking principles are often in conflict with Islamic law since charging interest is not allowed. For example, the purchasing of a drug information reference or textbook online becomes complicated since credit cards are not used. The faculty development program has been extended to the other Kurdish pharmacy schools and to date. Belmont has hosted 10 faculty members from the three schools in Kurdistan.

Since a PhD is required to teach in higher education, the Pharm.D. Degree is not sufficient for faculty appointment. Most current faculty in the Kurdish pharmacy schools was educated in Iraq, mostly at the University of Baghdad. The need for qualified faculty is so great that hiring of adjuncts has been required in order to fulfill the faculty needs in Kurdistan. Current faculty are partnering with Kurdish medical faculty to deliver the newly adopted curriculum.

In 2008, the curriculum reform committee envisioned that graduates of the new Doctor of Pharmacy program will become the leaders of change in pharmacy in Kurdistan and Iraq by creating the needed drug information centers, poison control centers and clinical pharmacy disease state management programs. The curricular revision process that began amidst the Iraq war, is now in its third year of implementation. Feedback indicates that the Kurdish faculty are using what they have learned and making the new curriculum their own.

Conclusion

It is hoped that the curricular revisions will prepare students to become pharmacists that are ready for the future of pharmacy practice in the region. As these pharmacists graduate with greater clinical skills, it is anticipated that they will improve patient care and become leaders in transforming the pharmacy practice model in Kurdistan. Changes and adoption of the curriculum have occurred

	Previous B.S. Curriculum	New B.S. Curriculum	New Pharm.D. Curriculum
Total Credit Hours	170	170	224
Laboratory Credit Hours	48	20	18
Experiential Credit Hours	8	8	40
Didactic Clinical Pharmacy Credit Hours	2	31	41

Table 2: Credit Hour Comparison of Previous and Proposed B.S. in Pharmacy Curricula

albite slowly due to the regional political strife. This work serves as a beginning foundation of change for the practice of pharmacy in the Kurdish Region of Iraq.

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