

The necessity of revision and reform in Iran pharmacy education: Finding a way for evolution

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Abstract

The pharmaceutical profession has long been recognized as one of the key components of the health systems. Pharmacists are playing roles in various aspects of health care, including production, distribution, and rational monitoring of drug use by patients. The training of efficient manpower is one of the most important goals of those in charge of training in this discipline. Because of different challenges that pharmacy education is facing including its inadequacy for professional directing, irrelevancy to future roles, improper position of pharmacists in the health system, and lack of many pharmacy-based services, education professionals agree on the need to revise the curriculum. It is necessary to obtain comprehensive information on the current state of pharmacy education before that and act based on shreds of evidence and domestic priorities. In this article, we aim to explain the necessity of revision of pharmacy education and pharmacy curriculum as its core. We try to explain our idea of the corrective plan and the considerations.

Keywords: Pharmacy education, Iran, Curriculum, Competency-based education, Pharmacy practice.

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1. Introduction

The pharmaceutical profession has long been recognized as one of the key components of health systems and the role of pharmacists in various aspects of health care, including production, distribution, and rational monitoring of drug use by patients is of considerable importance. Accord-

ing to the upstream and downstream expectations of pharmacists to improve the health indicators of society, training of efficient manpower is one of the most important goals of those in charge of training in this profession.

Global healthcare expenditure has been increasing, dramatically. The rate of errors related to prescribing medicines is considered a major problem within healthcare systems and may lead to adverse drug reactions (ADR), many of which

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can be prevented. As a result, there is a massive opportunity for pharmacists to play an eloquent role in reducing the mentioned costs, as they have competencies to find out, resolve, and prevent medication-related problems. Several published studies have shown that clinical interventions and services provided by pharmacists minimized the risk of probable ADRs and improved patients outcomes. These pharmacist activities are considered to be cost-effective (1).

Due to the rapid growth of changes in teaching methods in the field of medical sciences in general and the field of pharmacy in particular, from the past to the present the " Doctor of Pharmacy (Pharm.D.) Curriculum" has changed at different times, and now every education professionals emphasize on the need of revising the curriculum. However, making major changes in education is a serious matter that can weaken education in the absence of scientific and reasoned actions. Furthermore, pharmacy education may still be affected by such measures to this day.

"Iran Pharm.D. Curriculum (IPC)" has been revised four times after the Islamic revolution in 1979 (1357 Solar Hijri (SH)). First in 1983 (1361 SH), second in 1989 (1367 SH), third in 2006 (1384 SH), and the last time in 2017 (1395 SH). According to the "Academy of Medical Sciences of the Islamic Republic of Iran" report on revising IPC, none of the mentioned revisions made a meaningful impact on the framework of pharmacy education in a period of three decades (between 1361 and 1391 SH) (2).

As a result, it is necessary to obtain comprehensive information on the current state of pharmacy education and the views of all stakeholders on the quality and details of pharmacy education before any corrective action and intervention. A comprehensive view allows the correct actions to be taken with the correct knowledge of the current situation and understanding of all the strengths and weaknesses, and the opinion of the stakeholders of pharmacy education in reforms and interventions.

2. Current status of Iran pharmacy education

Iran is a middle-income country located in the EMRO (East Mediterranean Regional Office) region of the World Health Organization (WHO).

Table 1. Total credits of IPC divided by main fields.

Field of courses	Total credits
General	24
Basic sciences	58
Specialized	104
Practice experience	18
Thesis	8

According to the databank reports in 2018, its Gross Domestic Product (GDP) per capita was announced about 3598.483 USD (3). The Human Development Index (HDI) and the Inequality-adjusted Human Development Index (IHDI) value of Iran was reported around 0.783 and 0.693, respectively, by United Nations Development Programme (UNDP) (4).

According to the latest version of IPC, students should pass 212 credits which are divided as Table 1. Each student must pass 180 credits to be able to take the "comprehensive pharmacy exam". After passing the exam, students must pass 32 credits and graduate by submitting and defending their dissertation. Pharm.D. graduates can work in various fields including pharmacy, industry, hospital, research, policy-making, and education.

A general pharmacist can attend Ph.D. programs in which there are 12 programs held in Iran including Pharmacology, Pharmaceutics, Pharmacognosy, Toxicology, Medicinal chemistry, Clinical pharmacy, Nuclear pharmacy, Traditional pharmacy, Pharmaceutical biotechnology, Pharmaceutical nanotechnology, Pharmacoeconomics and Pharmaceutical Administration, and Drugs control.

3. What is Pharm.D.? Who is a pharmacist?

There are various definitions for pharmacy and there are more than that for Pharm.D. It is suggested that pharmacy is a science-based and patient-facing profession whose concern is drugs (5). It is opined that Pharm.D. is a program mainly clinically oriented and its graduates tend to practice as community or hospital pharmacists to give pharmaceutical care. In this opinion, other pharmaceutical fields such as industry, developing new formulations, drug discovery, pharmaceutical management, and so on are expected to cover in pharmaceutical sciences bachelors (6).

A definition for “pharmacist” offered by the International Pharmaceutical Federation (FIP) is as below (7):

“A pharmacist is a scientifically-trained graduate healthcare professional who is an expert in all aspects of the supply and use of medicines. Pharmacists assure access to safe, cost-effective and quality medicines and their responsible use by individual patients and healthcare systems.”

In the case of Iran, IPC describes pharmacy as “one of the major fields of the medical sciences established to meet the needs of the society”; and pharmaceutical professionals are expected to have “sufficient general knowledge in different areas of pharmaceutical sciences to meet pharmacy-related needs of the society”. This knowledge should be both directed “to better understand pharmaceutical sciences and better serve to the needs of the society” and “to achieve scientific capabilities in the area of research and study in pharmaceutical sciences” (8).

All of these should be guides and visions for pharmacy education. As a result, pharmacy education should be directed to ensure the administration of safe, appropriate, and cost-effective drugs for individuals, and should respond to patients’ drug-related needs. Also, pharmacy graduates must be utilized to guide other healthcare cadres to use the most effective and safe drugs in a safe and appropriate manner for patients (9).

A Pharm.D. curriculum should provide the scientific knowledge which is required for synthesis, formulation, preparation, qualification, storage, and rational administration of drugs to students. As stated by FIP, professional education should be directed to (5):

“Producing high-quality professionals for high-quality patient care, public health, and scientific advancement objectives, ensuring all education and training delivered to our professional workforce is of the highest quality and prepares them well for current and future roles.”

However, pharmacists should have competencies besides pharmaceutical knowledge. The WHO, in a 1997 statement, named the term “seven-star pharmacist” to train a capable workforce as the main goal of training curricula and stressed the importance of updating pharmacists’ training pro-

grams as needed by the community and patients. The seven characteristics of an ideal pharmacist according to the WHO are caregiver, decision-maker, communicator, leader, manager, lifelong learner, and teacher (10).

As a caregiver, pharmacists should assist their knowledge and skills to achieve optimal outcomes for each patient and improve or maintain their quality of life. They should be able to make evidence-based decisions by critical thinking. They should respond to all kinds of verbal or written questions from various audiences –from physicians to illiterate people. Pharmacy graduates must have the ability and commitment of learning and seek the answers to their questions during all of their professional lives. They should have the responsibility to transfer their knowledge and experience to the next generations, too (11).

4. Complications of pharmacy education in Iran

There are mainly two drives that cause change and progress in pharmacy and consequently, pharmacy education. First, the fast pace of pharmaceutical industries to find and develop new compounds and medicines (12). This makes more and more pharmacy students enthusiastic for directing their professional future toward the pharmaceutical industries. Second, this fact that pharmacists found themselves over-trained for only dispensing the drugs on the order of physicians’ prescriptions. As a result, a global shift toward more clinical and patient-oriented services has occurred in pharmaceutical decision-making (13).

There is a global shift from product-oriented to patient-centered services in pharmacists’ professional activities. For instance, there is a gap between drugs responses in clinical trials and their responses in real therapeutic processes. It is suggested that this gap is due to drug-drug interactions, improper dosage adjustment, and wrong administration of drugs. Moreover, medication treatment management (MTM) is a way to guarantee the safety and efficacy of prescribed medication and reduction of their costs (14). The most competent person to fill this expectable gap and employ MTM is the pharmacist. So, patient-oriented pharmaceutical care must be the most important service by pharmacists (15). It is believed

that a major amount of the Pharm.D. curriculum should be devoted to pharmaceutical care units and some studies revealed that more courses on clinical pharmacy make pharmacists more capable for pharmaceutical care and clinical situations management (16). Unfortunately, it is shown that IPC has no focus on pharmaceutical care, and probably no other fields of the pharmacy profession (17).

As a common problem in low- to middle-income countries, pharmacy curricula are less relevant to pharmacists' roles. In particular, although it seems that IPC is mostly oriented toward playing the role of a community pharmacist, there are many defects in knowledge and skills which are necessary for being a well-educated community pharmacist. On the other hand, despite there are internal enthusiasm and external needs for pharmaceutical care in hospitals and pharmacists' presence in pharmaceutical industries, few practical and effective courses are present in IPC.

As another complication, curriculum development in developing countries including Iran is chiefly based on mimicking western curricula such as the United States (US). For example, there is a massive pressure to heighten the impact of clinical pharmacy courses in IPC, only to follow pharmaceutical care and hospital pharmacies re-professionalization in the US. But no one asked whether physicians, patients, society, or even pharmacists themselves are eager for this change. This is an important principle that education evolutions must be based on the society requirements, socio-economic, and cultural situations and priorities of the country (18).

Many experts believe that the concept of the Pharm.D. program is not well-understood in developing countries. There is an assumption that mere change of B.Pharm. (Bachelor of pharmaceutical sciences) programs to Pharm.D. would cause a shift toward pharmaceutical care and patient-oriented professionalism (19). Obviously, this is wrong and other conditions of society, medical staff, and elder and younger pharmacists' points of view should be considered. Even in developed countries like the US, it took years for pharmacists to evolve from a dispenser to a caregiver (6).

There are many other complications in pharmacy education in Iran, including insufficien-

cy of Pharm.D. program for domestic needs and its adequacy for international acceptance which leads to pharmacists export, improper distribution of pharmacists both between urban and rural environment and between different professional fields (such as community pharmacy, hospital, industry, etc.), the power struggle between pharmacy and medicine, lack of standards of an ideal education and practice, and use of "ancient" methods of learning (19).

5. Suggested steps for revision

We believe that pharmacy education and IPC as its core need to be revised by experts and based on evidence and concerns of all pharmaceutical fields. The most important step is to know the current situation of pharmacy and pharmacy education in Iran. SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis might be a proper method to achieve this goal. Secondly, we need to hear the voice of all stakeholders of pharmacy education. Faculty members, students, community pharmacists, clinical and hospital pharmacists, pharmacists practicing in production, distribution, and import industries, regulatory and Iran Food and Drug Administration (IFDA), scientific associations, syndicates, physicians, and patients, all should be invited to talk about their points of view about pharmacy and pharmaceutical practice. Thirdly, comparative studies should be made to compare the situation of pharmacy practice and its direction in Iran and both similar and more developed countries. With the first, we would know about our current situation in the world and minor changes that might be helpful and act as palliative therapy. With the latter, we understand the future directions and orientations that pharmacy education and practice must be guided to. Fourthly, we should discuss the proper aims, methods, and implementation process of an ideal pharmacy program. We suggest that the six gold standards for medical sciences universities announced by the Education Vice-chancellor of the Ministry of Health and Medical Education might be a proper guide for this purpose. These gold standards are scientific authority, the convergence of sciences and technologies, missionary, social responsiveness, international prominence,

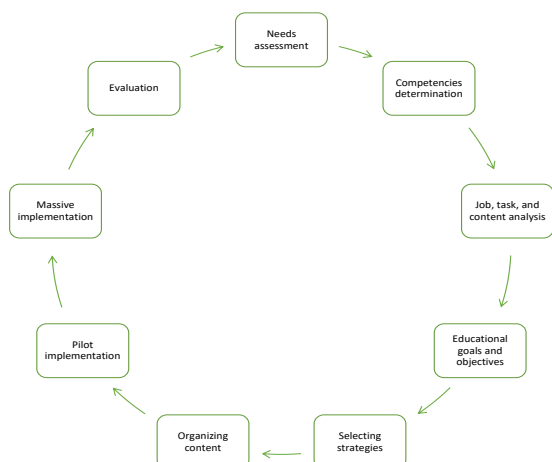


Figure 1. The cycle for curriculum development and wisdom-based-ness.

Valid and scientific methods for any change or reform in IPC must be employed. The needs of society and students should be followed for designing the curriculum and reforming the courses. According to competency-based education, we should plan the education system to build abilities and capabilities in students, not only knowledge acquisition (20). The IPC must be oriented toward building knowledge and skills that students will need in their professional practice in the future. Based on these needs and competencies, educational goals and objectives have to be set. Selecting content and learning strategies is the next step. After organization and validation of the whole curriculum it should be implemented on a pilot scale and after necessary evaluation and probable corrections implement to all universities. The most important point is that the program should be evaluated and controlled periodically and this cycle, as shown in Figure 1, must be repeated every few years (21, 22).

Four reasons suggested as barriers for implementation of pharmaceutical care and developing pharmacy students' talents in low- to middle-income countries: 1) negative influence of pharmacy professionals, 2) negative influence of other healthcare professionals, 3) lack of a proper description of pharmacists' job, and 4) slow changes in the educational program (23). It seems that all

of these reasons are true about Iran, too. Wrong decisions by managers of education and practice of pharmacy, besides the negative propagation of some pharmacy influencers (such as faculty members, pharmaceutical industries practitioners, etc.) are harming pharmacy and its education. The negative influence of other healthcare cadres that do not accept the role of pharmacists in the health system and prevent their presence in decision-making is a real phenomenon in Iran. As we discussed earlier in this article, there is no significant definition or orientation for pharmacy education and pharmacy practice, which potentiate each other in a vicious cycle. And as we said, changes in IPC are mostly irrational and improper.

6. Conclusion

Pharmacy society has various problems in Iran. From education to community and hospital pharmacies, from pharmaceutical industries to management and decision-making, all have their own complications and problems. We believe that pharmacy education is one of the most important points to correct. Any correction and improvement in pharmacy education can lead to observable improvements in other fields. On the other hand, any wrong decision and deterioration may have destructive consequences in all pharmaceutical fields. Noteworthy, changes in education would have long-lasting impacts. We should attempt to find the best ways for evolution and completion of pharmacy education based on the priorities of our country, with the hope of the slightest improvement in pharmacy society.

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Conflict of Interest

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