Journal of Pharmaceutical Care
jpc.tums.ac.ir

Comparison of Iran's and World's Leading Faculties Approved Curriculum in the Field of Pharmacy, in terms of Pharmaceutical Care Education

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Received: 2016-11-01, Revised: 2016-11-24, Accept: 2016-11-26, Published: 2016-12-01

ARTICLE INFO

Article type:
Original article

Keywords:
Pharmacy
Curriculum
Pharmaceutical Care

ABSTRACT

***Background*:** Following the changes in the basic concepts of pharmaceutical science, the main opinion in pharmacy practice changed from "drug-oriented pharmacy" to "patient-oriented pharmacy", leading to changes in the pharmacy education in many aspects.
Methods: In the presented study, we compare Iran's Pharm.D education system and the four of high ranking systems available in the world in term of pharmaceutical care related educations and how much is the portion of this type educations in the curriculum. The University of California, San Francisco (UCSF) with a rank of 2, The University of Michigan with a rank of 7, and the Universities of Pittsburgh and Purdue with ranks of almost under 50 in the world ranking have been selected.
Results: The results showed, in the United States (US) colleges about 60.5% of educational program was related to the pharmaceutical care concept. This calculation for the University of Waterloo was about 74%. The Saudi University compared, had about 47% related units. Regarding the Iranian program, when the specialized units after basic science were considered as the professional course, about 24% of them had a relationship with the pharmaceutical care. However, this was in the case that a student chooses the hospital internship instead of industry internship in the final year; otherwise, the percentage would reduce to 22.7%.
Conclusion: Based on the results of this study, and regarding internationally accepted standards, we strongly recommend to change the structure of pharmacy curriculum in Iran to improve the ability of students for patient-oriented services.

J Pharm Care 2016; 4(3-4): 58-63.

► Please cite this paper as:
Eslami K, Kheiry avarvand O Kouti L, Izadpanah M. Comparison of Iran's and World's Leading Faculties Approved Curriculum in the Field of Pharmacy, in terms of Pharmaceutical Care Education. J Pharm Care 2016; 4(3-4): 58-63.

Introduction

It was almost in the 1960s, when changes in the basic concepts of pharmaceutical science and related services begun. The changes were mostly correlated with introducing the first concepts of clinical pharmacy in those years, and then spreading the basic content of what we know today as pharmaceutical care services (1).

Followed by this evolution, the dominant opinion in pharmacy changed from "drug-oriented pharmacy" to "patient-oriented pharmacy", leading to changes in the pharmacy education in many aspects, setting the purpose of training pharmacy students more than before, having an active role in the therapeutic process, and offering

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Table 1. Pharmaceutical care related units in Iran core curriculum.

Iran core curriculum	L:lecture P:practical	UCSF	L:lecture P:practical
Ethics in pharmacy	1L	Pharmacy practice	3.5 p(practical)
Cosmetic	2L	Pharmacy law & ethics	3 L(lecture)
Therapeutic 1	3L	Introductory pharmacy practice experience(IPPE)	1.5 P
Therapeutic 2	3L	Pharmacy practice 2	3.5P
Therapeutic 3	3L	IPPE 2	1.5P
Therapeutic4	2L		
Medical equipment	2L	Pharmacy practice 3	3.5P
Therapeutic regimens	1L	IPPE3	1.5p
Management in pharmacy	2L	Applied drug information	1.5L
Pharmacoeconomics	2L	IPPE4	1.5P
Hospital pharmacy	1L	Endocrine & immunologic agents	3L
Apprenticeship in community pharmacy	2P	IPPE5	1.5P
Apprenticeship in hospital pharmacy	1P	Therapeutics	6 P&L
Community pharmacy clerkship	6P	Health policy for pharmacist	3L
clerkship rotation in hospital (offered as optional choice with industrial clerkship and community pharmacy clerkship)	2P	IPPE6	1.5P
Total clinical related units	33	Chemotherapy	4.5L
Percentage among 6 year's units including *health care system principles* and *first aids* units Total units:212	15.5%	Therapeutics2	6 P&L
Percent of clinical related (Total of specialized units are: 136) For a better compatibility with world's universities we consider specialized units as main source for our compares	24%	Therapeutics 3	4 P&L
Percent of clinical related without choosing hospital clerkship in the last semester (choosing industrial instead) (Total of specialized units are:136)	22.7%	IPPE7	1.5P
		Therapeutics4	6 P&L
		Topics in pharmacy administration	2 L
		Applied drug information	.5 L
		Advanced topics in clinical care	3 L
		IPPE8	1.5P
		Advanced pharmacy practice experience (APPE) Full time of year 5 Hospital/community/ambulatory/acute patient care	28 p
		Total clinical related	93 units
		Percent of clinical related (Total of 4 year units are:149)	62%

pharmaceutical care services in hospitals and community pharmacies (2, 3).

In Iran, more than 90% of pharmacy graduates are attracted to hospital and community pharmacies among other job opportunities. As we know, hospital and community pharmacies are the most important places for offering pharmaceutical care services for pharmacists. Therefore, this high percent of graduates who like to be active on this side of service in our country indicates the importance of pharmaceutical care related educations in our academic system (4).

It is obvious that that any big change in the education system should start with designing a new curriculum or at least make great changes in the old one, which lead to tangible differences in the syllabuses of units, and weight of each course in comparison with the previous situation.

There are internationally accepted standards among pharmaceutical societies, like Good Pharmacy Practice guideline and Accreditation Council of pharmacy education standards. These standards also can be used in designing curriculums with local necessity considerations.

GPP[1]

The GPP published by FIP[2] and WHO[3], is the most reliable guideline in many aspects of pharmacy, having standards and important terms for training pharmacists worldwide.

In a part of GPP, it has been indicated that the gap between therapeutic responds observed in clinical trials, and what we see from drugs during the real therapeutic process can be because of possible interactions with other drugs, wrong administration of drugs, or wrong dosage adjustments. GPP says that the most important person for solving the problems of this expectable gap is the pharmacist, and says that the patient oriented services with pharmaceutical care parameters are the main role of pharmacists in today's world of medical sciences. So, as we see in the final part of GPP sorting the main roles of a pharmacist, the importance of patient oriented services is such enough that we can say the major amount of curriculum parts should be devoted to pharmaceutical care knowledge and related units (5).

ACPE[4]

ACPE or accreditation council for pharmacy education is the national agency for the accreditation of professional degree programs in pharmacy and providers of continuing pharmacy education in the United States. Accrediting curriculums and setting standards for designing them is the main duty for ACPE. It is mentioned in ACPE's guideline that pharmacy school curriculums should contain JCCP[5] standards that are bringing in a program named as 'Pharmacists' Patient Care Process. The final and most important purpose of training pharmacists ,which is the digest of all goals in the GPP, ACPE and all of modern standards is the best and most useful direct contact between pharmacist and patient and active attendance in therapeutic process together and with contact together other medical experts (6, 7).

1 Good pharmacy practice
2 International Pharmaceutical Federation
3 World Health Organization
4 Accreditation council of pharmacy education
5 Joint Commission of Pharmacy Practitioners

Iran's core curriculum

With a little deliberation on the Iran's pharmacy core curriculum, we could see that as it came first on the part of "final goals" part of the introduction of the program, the main role of a pharmacist, like GPP and ACPE, is pharmaceutical care related services putting the pharmacist in a direct contact with patients.

So, in this study, we aim to investigate the accordance between the content of Iran program and its goals, and the difference between Iran and world's leading faculties approved curriculums in the field of pharmacy, in terms of pharmaceutical care education (8).

Methods

To make a comparison between the Iranian system and the other systems available in the world, having a Pharm.D program was important and a necessity. Four of the best faculties in the United States having better places in the world rankings, were chosen. The ranking system used was QS University ranking 2015, in the group of pharmacy. The universities chosen include, the University of California, San Francisco (UCSF) with a rank of 2, the University of Michigan with a rank of 7, and the Universities of Pittsburgh and Purdue with ranks of almost under 50 in the world ranking (9-13).

To have diversity from of the United States (US) system, we also chose a Canadian university, Waterloo, which Pharm.D program offered by school of pharmacy in natural science faculty with the worldwide rank of 84 (14).

To have a comparison with the Iran's neighbor countries, because of similar pharmaceutical needs which can come from geographical and cultural similarities, we chose the King Faisal University of Saudi Arabia having a good rank among the other faculties of the neighboring countries (15).

To access the required information, firstly, the web resources of schools were used, and for more information on specific cases, using direct communication with schools was on our agenda. In choosing units, higher coherence to the pharmaceutical care concepts was our priority. We analyzed the curriculums and compared them by how much they contain units with more similarity to the pharmaceutical care concepts.

For Iran's curriculum, we calculated the amount

Table 2. Comparison of pharmaceutical care related units in selected universities

Percentage of Apprenticeship courses to the whole related course	Length of clinical pharmacy clerkship course	Number of units (for Iran only specialized units are mentioned)	Number of pharmaceutical care units	Percentage of pharmaceutical care units to the whole units	University
30%	1year	149	93	62%	UCSF
40%	1year	128	86	67%	Pittsburgh
50%	1year	143	79	55%	Purdue
42%	1year	128	75	58%	Michigan
33%	6 months	30.25	22.5	74%	Waterloo
39%	1year	185	88	47%	King Feisal
27%	-	136	31	22.7%	Iran without clinical pharmacy clerkship course
34%	3 months	136	33	24%	Iran with clinical pharmacy clerkship course

and percent of the program's relationship rate to the pharmaceutical care concepts, firstly, among all units of whole six years, and then for more conformity with under comparison faculties we calculated just specialized units which was after the basic educations and had more expert contents.

A considerable point in the Iran's curriculum was the optional offering of the hospital and industrial clerkship, so if students had chosen industrial clerkship, the percentage of the program's relationship to the pharmaceutical care would have reduced.

Results

The most relevant courses in the field of pharmaceutical care were separated from the rest of the course and their percentage of the total number of units was calculated. The results of the training program studies have been summarized in the Table 2. In an overview, as shown in the Table 2, in the US colleges about 60.5% of educational program was associated with the training services and medical care. This calculation for the University of Waterloo was about 74%. And the results for King Feisal University show the number of 47% of the pharmaceutical care related units.

Regarding the Iranian program, when the specialized units after basic science were considered as the professional course, including 136 units, about 24% of them had relationship with the pharmaceutical care. However, this was in the case that a student chooses the hospital internship instead of industry internship in the final year; otherwise, the percentage would reduce to 22.7%. (Figure 1).

Regarding the number of practical units related to the medical care, no certain continuity between the US colleges was observed, and the percentage of the total number of practical units related to the field of pharmaceutical care were different, from 78% of the UCSF University to 48% for the University of Michigan. This Percent was calculated 33% for the University of Waterloo and 60% of the Saudi university.

Iran's program had an average of these two modes, with the hospital internship; that the percentage of related practical training was about 34% of the total related units. The US colleges had a full year of clerkship course comprising about 40.5% of the total units related to the field of pharmaceutical care. The Canadian University of Waterloo allocated six months to clerkship, which was about 33% of the related courses in this university. The Saudi King Faisal University had a full year of clerkship course which was about 39% compared to the whole related units.

Discussion

The results of our study showed the importance and the centrality of pharmaceutical care in a high level pharmaceutical education program in the world. However, it seems that Iran does not have a focus on these educational programs.

In terms of the number of practical units assigned to the field of pharmaceutical care, it's obvious that the Iranian program is extremely weak in the theory and very far from the ideal one.

Even in Saudi Arabia, we have a significant difference with 55 percent of the practical units to the total medical care units, when this percentage in Iran universities are really low. Most programs allocate the last year to the clerkship course associated with medical care, mainly in hospitals.

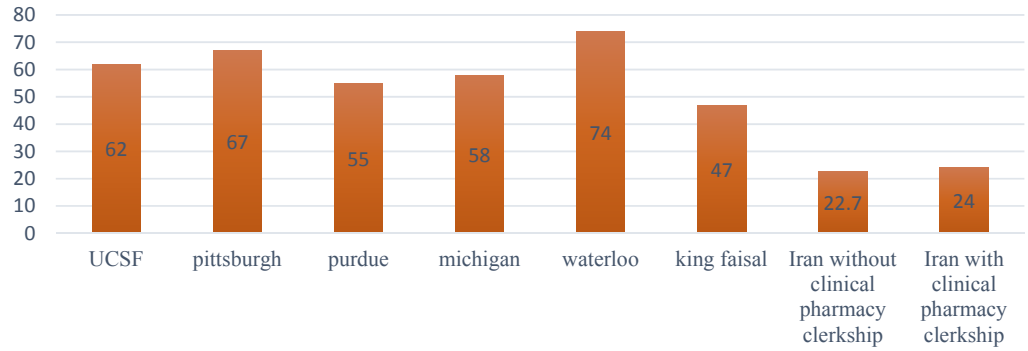

Figure 1. Percentage of pharmaceutical care units to the whole units.

And as we were almost expected, the better rank a university have is related to have a curriculum with more focus on clinical oriented units.

Need to change on the basis of pharmaceutical education is a serious topic which has been monitored and analyzed over the years by many researchers. Ahmed et al., after a review of early changes in the world of pharmacy, predict that with the progress of clinical pharmacy concepts, we should have a fundamental change in pharmaceutical education, especially for having best outcome in training pharmacists for giving better pharmaceutical care and patient-oriented services (1).

Birenbaum et al., Studied on a population of newly licensed pharmacist for analyzing their expectations of the education system and what experiences they should got during the years of being a student in pharmacy school, for facing the realities in working space and real problems in it. Results show that increase in the amount of clinical pharmacy related units in the curriculum of pharmacy can improve their ability in handling real situations in community and hospital pharmacies and also parts of their job which is related to direct contact with patients (16).

The study of Toklu et al., revealed a big shift from a product focused programs to patient-oriented services could have an effect on different aspects of pharmacy and especially on pharmacy education standards and ideals .they say that in today's health care system role of pharmacists should be changed and specially include pharmaceutical care concepts, and provide the ability of being a health care professional and not just a drug seller. Therefore, pharmacy schools should prepare a program that has competence with the changing role of the pharmacist (2).

Based on the results of this study, and regarding internationally accepted standards we strongly recommend to change the structure of pharmacy curriculum in Iran to improve the ability of students for patient-oriented services. We can say that it should contain the increase in the amount of pharmaceutical care-related, related clerkships, work on improving the ability of students for patient oriented services and having a more active role in the treatment process.

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