Original Article

PHARMACOGNOSY AND NEW TRENDS OF B. PHARM SYLLABI

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ABSTRACT

Objective: The Pharmacy profession has evolved from its conventional drug focused basis to an advanced patient focused basis over the years. Accordingly, many universities worldwide are modifying their Curricula in order to reflect this change.

Methods: This paper investigates and compares the syllabi of B. Pharm for different Universities in Africa and Asia. Pharmacy Syllabi of the included Universities is presented in the form of Sectors, i.e. Pharmaceutical Sciences, Clinical Pharmacy, Biomedical, Training and University Requirements. Percentage analysis of credit hours allotted to courses of each Sector performed with special emphasis on courses of Pharmacognosy and Pharmaceutical Science in comparison to courses of Clinical Pharmacy.

There is a substantial decrease in teaching hours of Pharmaceutical Sciences, particularly Pharmacognosy within the B. Pharm Curricula of some of the included Universities at the expense of including more courses in Clinical Pharmacy.

Results: Pharmacists are scientists as well as clinicians, and basic science knowledge such as pharmaceutical sciences, give pharmacy graduates critical scientific foundations, in this regard, the reduction in pharmaceutical sciences content in a pharmacy curriculum may compromise the competence of pharmacy graduates, as the drug experts from the basic science level to the clinical level.

Conclusion: The impact of reducing pharmaceutical science content, may compromise the Pharmacist ability to assume certain duties in the countries included in the study. This in consideration that Clinical Pharmacy is not widely practiced in the investigated countries and its application is limited compared to other job opportunities available for Pharmacy graduates of these countries such as Community Pharmacy, Pharmaceutical Industries, marketing and sales and utilization of natural resources of medicinal plants by research and development units.

Recommendations on how to avoid such decrease in teaching hours of Pharmaceutical Courses and fulfil the job requirements in the above countries are given.

Keywords: Pharmacy profession, New trend Pharmacognosy.

INTRODUCTION

Although, Clinical Pharmacy is well recognized in developed countries, its implementation is still at nascent stage in developing countries [1]. The profession of Pharmacy in developing countries is geared more into Community pharmacy and the Pharmaceutical Industry, i.e. it is still product oriented rather than patient focused practice. Moreover, the role of clinical pharmacist is still unclear among health authorities and the community [2, 3].

Advancements in the field of pharmaceutical sciences and progressing role of pharmacist in direct patient care are compelling pharmacy institutions to come up with new courses oriented towards patient care [4]. The introduction of Clinical Pharmacy has necessitated a change in the current curriculum of pharmacy education in developing countries [5].

During the last few years, the worldwide move towards placing more emphasis on Clinical Pharmacy has resulted in substantial expansion of Clinical pharmacy courses in B. Pharm Syllabi while there was associated trend of diminishing Pharmaceutical Sciences Courses, especially Pharmacognosy. This is mainly due to increasing application of Clinical Pharmacy in Developed Countries.

Basic science content must be maintained in pharmacy curricula if the profession is to survive because basic science content is foundational for the understanding of human disease and associated drug therapies [6]. The basic science in Pharmacy curriculum gives students a sound foundation on which to develop the skills necessary for patient-centered pharmaceutical care [7].

Recently, moves to increase emphasis on clinical work have extended to some Developing Countries without considering the extent of its application, the readiness of Pharmacy Practice and the national needs of these countries. In South Asian and Southeast Asian countries, it has been reported that there is a deficiency of an ideal clinical pharmacy setup in health care system [8].

It seems controversial why there was a need for PharmD program in many developing countries; the adoption of PharmD program in developing countries was either based on true needs or it was just started to fulfil the needs of international standards [9].

The curriculum of the American universities and periodic updates by the Accreditation Council of Pharmacy Education (ACPE) are the main source of inspiration for such countries. Often it is seen that curriculum is updated, revised or some time copied from these resources. This practice gives rise to many questions such as whether or not this course fulfils the specific national needs of the countries involved, whether there are enough facilities in the local institutions and health care authorities, which allow the students to practice what they have learned theoretically [8].

MATERIALS AND METHODS

Data collection

Data is collected by Internet using Google Search through the Key Words: Pharmacy Study Plan, Pharmacy Syllabi, Universities, Africa, Asia, Pharmacognosy, Clinical Pharmacy [10-25].

Data analysis

The Credit hours structures of B. Pharm Programs for the included Universities in Developing Countries is classified into 4 main sectors: 1-Pharmaceutical Sciences; 2-Clinical Pharmacy; 3-Biomedical sciences and 4-University Requirements.

The Pharmaceutical Sciences include the basic subjects of Pharmacy, i.e. Courses in Pharmaceutics, Pharmacognosy, Pharmacology and Pharmaceutical Chemistry.

Clinical Pharmacy include courses and training such as: Clinical Pharmacy, Clinical Nutrition, Pharmacy Practice, Hospital Training, Community Training, OTC Drugs (Non-Prescription), Patient Assessment and Pharmaceutical Care, Legislation, Pharmacy Law, Pharmaco-epidimeology, Pharmacoethics, Pharmacoeconomics, Pharmacy Management and Marketing. The Biomedical Sector includes Anatomy and Physiology, Biochemistry, Microbiology, Pathology and Biotechnology.

University Requirements include Arabic and English Languages, Islamic studies, Social and Psychological studies, Computer Application, Statistics, Art, Innovation and Research and others.

Descriptive analysis for data on the above four Sectors was performed.

RESULTS

Table 1 illustrates a comparative distribution for credit hour structures of B. Pharm Programs between Universities in UAE. The total B. Pharm. Credit hours range between 145-170 credit hours, with an average of 158 credit hours instructed within 4 y. This includes theoretical and practical teaching as well as training. The credit hours allotted to Clinical Pharmacy in these Universities range between 26-50 credit hours with an average of 24% of the total B. Pharmcredit hours. This is relatively high as compared to total subjects of all Pharmaceutical Sciences (Pharmaceutics, Pharmacognosy, Pharm, Chemistry and Pharmacology) which range between 68-81 credit hours with an average of 48% of the total B. Pharm. credit hours. Pharmacognosy credit hours are relatively low (3-11 h) with an average of 4% of the Total B. Pharm. Credit hours.

Table 1: Credit hour structures of B. Pharm programs for UAE universities

S. No.	University	Total credit hours	Pharmaceutical sciences	Clinical pharmacy	Bio-medical	University requirements
1	Ajman University (Current)(10)	150	81 (54 %) *Cog 11(7.3 %)	26(17.5 %)	19(12.5 %)	24 (16 %)
2	Ajman University (Proposed)	160	74(46 %) Cog 06(3.6%)	39(24.5 %)	23(14.5%)	24 (15%)
3	Al-Ain University of Science and Technol.(11)	160	69 (43 %) Cog 05(3.1 %)	43(27 %)	15(9.5 %)	33 (20.5 %)
4	University of Sharjah(12)	170	68 (40 %) Cog 04(2.4 %)	50(29.5 %)	19(11 %)	33 (19.5 %)
5	Dubai Pharmacy College(13)	164	79 (48 %) Cog 09(5.5 %)	46(28 %)	21(13 %)	18 (11 %)
6	RAK Medical and Health Sciences University(14)	145	79 (54.5 %) Cog 03(2.1 %)	28(19.5 %)	17(11.5 %)	21 (14.5 %)
	Average	158	48% **Cog 4%	24%	12%	16%

*Cog: Refers to courses of Pharmacognosy.**Pharmacognosy Percentage calculated from Total Credit Hours.

The profile of the comparative distribution for credit hour structures of B. Pharm Programs between other Gulf Universities shown in table 2 is nearly the same as that in table 1. In these Universities, credit hours allocated to Pharmacognosy are even less than Universities in the UAE. It ranges between 0-5 credit hours with an average of 2% from the total B. Pharm credit hours. The expression "Natural Products" used in above Universities for courses of Pharmacognosy.

However the percentage of credit hours allocated to clinical pharmacy is relatively lower than the UAE universities, i.e. 18%

Table 2: Credit hour structures of B. Pharm programs for other gulf universities

S. No.	University	Total credit hours	Pharmaceutical sciences	Clinical pharmacy	Bio-medical	University requirements
1	Almaarefa College (Kingdom of Saudi Arabia)(15)	171	75(43.9 %) *Cog 05(2.9 %)	32(18.7 %)	32(18.7 %)	32 (18.7 %)
2	Kuwait University(16)	154	75(48.7 %) Cog 00(0%)	30(19.5 %)	24(15.6 %)	25(16.2%)
3	Al-Bahrain University(17)	143	77(53.8 %) Cog 03(2.1 %)	23(16.1 %)	19(13.3 %)	24(16.7 %)
4	Qatar University(18)	173	71(41.8 %) Cog 02(1.2 %)	47(27.2 %)	22(12.7 %)	33 (19.1 %)
5	Lebanese International University (Yemen)(19)	173	94(54.3 %) Cog 03(1.7 %)	31(18 %)	21(12.1 %)	27(15.6 %)
	Average	162	49% **Cog 2.1%	18%	16%	17%

Table 3 illustrates a comparative distribution for credit hour structures of B. Pharm Programs between Universities from Africa. The average total credit hours for the B. Pharm is 191 credit hours instructed within 5-6 y. In these Universities, an even balance is maintained between all Pharmacy subjects. Clinical Pharmacy has an average of 13.5% in the total credit hours, the other four Pharmacy subjects have a combined share of 57%. The Pharmacognosy subject has comparatively reasonable percentage of the credit hours (10%).

Table 3: Credit hour structures of B. Pharm programs for universities in africa

S. No.	University	Total credit hours	Pharmaceutical sciences	Clinical pharmacy	Bio-medical	University requirements
1	University of Khartoum (Proposed) (20)	190	118 (62 %) *Cog 19(10 %)	18(9.5 %)	32(17 %)	22 (11.5 %)
2	Cairo University (21)	192	104(54 %) Cog 21(11%)	38(20 %)	39(20 %)	11(6%)
3	University of Nigeria (22)	192	104(54 %) Cog 17(9 %)	21(11 %)	28(15 %)	38(20 %)
	Average	191	57% **Cog10%	13.5%	17%	12.5%

Table 4 shows a comparative distribution for credit hour structures of B. Pharm Programs between some Universities from Asia. The B. Pharm, total credit hours in these Universities are relatively higher with an average of 215 credit hours instructed within 5 y. A moderate distribution of Pharmacy subjects nearly maintained (Clinical Pharmacy 16%; total 4 Pharmaceutical Science subjects 52% of which Pharmacognosyis 6.7%).
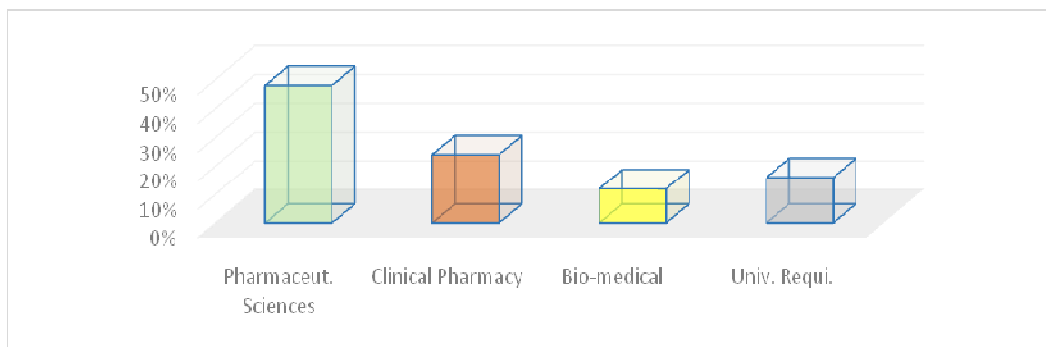
Table 4: Credit hour structures of B. Pharm programs for other universities from Asia

| S. No.	University	Total credit hours	Pharmaceutical sciences	Clinical pharmacy	Bio-medical	University requirements
1	Near East University (Turkey))(23)	215	115(53.5 %) *Cog 15(7.0 %)	53(24.6 %)	25(11.6 %)	22 (10.3 %)
2	Al-Baath University (Syria)(24)	265	136(51.5 %) Cog 23(9.0%)	20(7.5 %)	58(22 %)	51 (19%)
3	Jordon University of Science and Technology(25)	165	84(51 %) Cog 07(4.3 %)	29(17 %)	27(16.5 %)	25(15.5 %)
	Average	215	52% **Cog 6.7%	16%	17%	15%

Fig. 1 indicates that in UAE Universities, the credit hours allotted to Clinical Pharmacy subject are relatively high as compared to the total four subjects of Pharmaceutical Sciences. Whereas, in other Gulf Universities, it is relatively moderate. In Asian and African Universities, credit hours allotted to Clinical Pharmacy are in even balance with the total four subjects of Pharmaceutical Sciences. Biomedical and University Requirements are nearly similar in all universities.
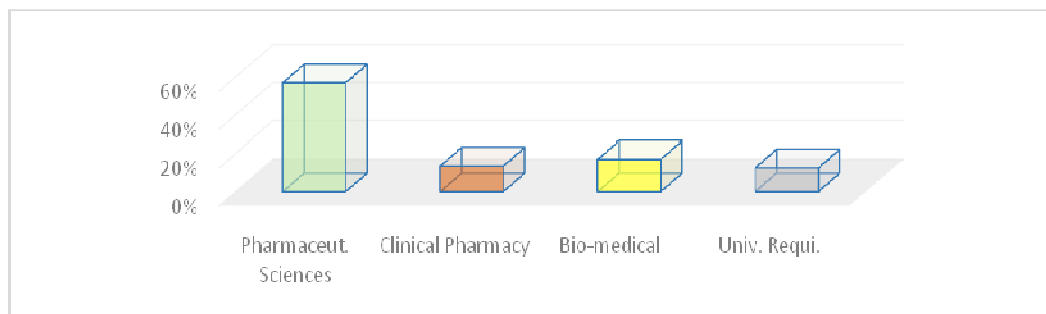
A-UAE Universities

B-Other Gulf Universities
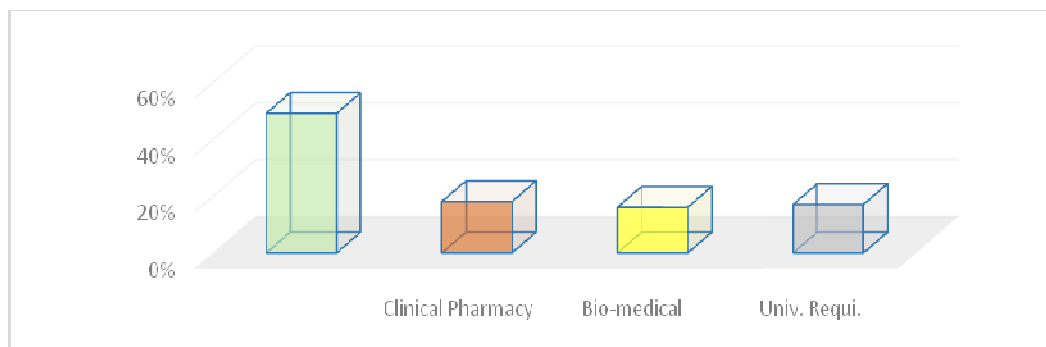
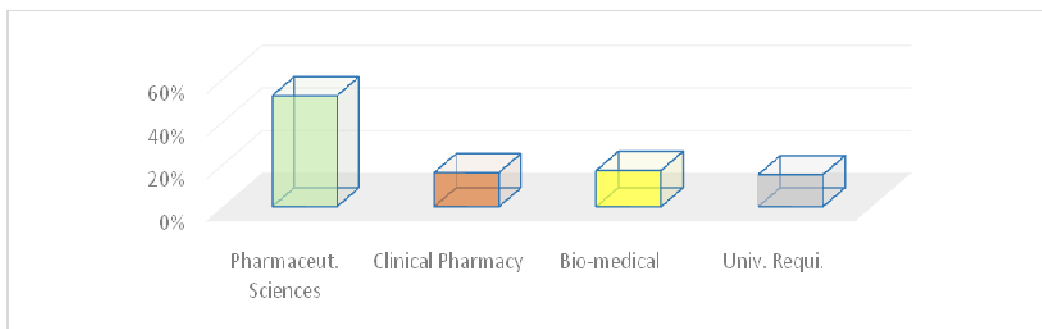**C-Universities from Africa**

D-Universities from Asia

Fig. 1: Comparative credit hour structures of B. Pharm programs

Fig. 2 indicates that in UAE and other Gulf Universities, the credit hours allotted to Clinical Pharmacy are relatively high compared to Pharmacognosy. Whereas in Asian Universities it is moderately high and in African Universities, it is nearly similar.
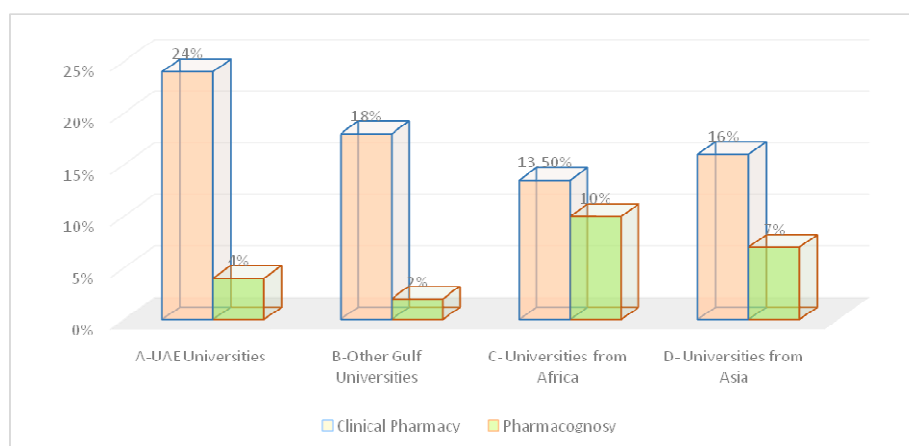

Fig. 2: Comparative credit hours of B. Pharm programs between pharmacognosy and clinical pharmacy courses

DISCUSSION

From above analysis of the results, we noticed that the credit hours allocated to Clinical Pharmacy Subject (18-24%) in Gulf Universities, is relatively high as compared to the four Subjects of Pharmaceutical Courses (48-49%) while credit hours allocated to Pharmacognosy range between 2-4%. In African Universities, total Pharmaceutical Courses have 57% share in the total number of credit hours for the B. Pharm, of which Pharmacognosy has 10% share; Clinical Pharmacy Courses have 13.5%, which show nearly even distribution between the Pharmacy Subjects. Some developing countries such as Sudan (University of Khartoum), Egypt (Cairo University), University of Nigeria and Syria (Al-Baath University) maintain such a balance. In Asian Universities, total Pharmaceutical Courses have 52% share in the total credit hours for the B. Pharm course of which Pharmacognosy has 7% share; Clinical Pharmacy Courses have 16% share in the total credit hours, showing somehow moderate distribution, though Pharmacognosy is relatively low. Jordan University tend to adopt syllabi similar to Gulf Universities and relatively different from other Asian universities such as universities in Turkey and Syria.

CONCLUSION

In Africa and Asia, Clinical Pharmacy is very limited in its application. Moreover, such countries need to develop their Pharmaceutical Industries, explore their natural resources of medicinal plants as raw materials for the Pharmaceutical Industry and increase the Community awareness for proper use of medicinal plants in Traditional Medicine. However, these issues require a knowledgeable Pharmacist in the field of Pharmaceutical Sciences including Pharmacognosy. Hence, the new trends in the total shift of Pharmacy Syllabi towards Clinical Pharmacy may not be practical, for the time being, in such countries. The change requires the involvement of not only Universities but also other Health care authorities and Regulatory bodies involved in Pharmacy Practice. In addition to the recognition of the new role of Pharmacist and availability of practice site in those countries.

What is required in these countries is a balanced curriculum that accommodates fundamentals of Clinical Pharmacy, the fundamentals of Pharmaceutical Sciences, in addition to gearing up their students towards the vital attitude of life-long learning or continuous professional development and proper training on evidence based practice. This should be in coordination with Health authorities and Regulatory bodies involved in Pharmacy Practice who decide the National needs of the country in the field of Pharmacy Services. Complementary Degrees such as PharmD and Master of Clinical Pharmacy or Industrial Pharmacy, designed according to the National needs can be beneficial. Adequate increase of total credit hours in some universities in order to cover fundamentals of pharmaceutical sciences and fundamentals of clinical pharmacy may also work.

AUTHORS CONTRIBUTIONS

All the author have contributed equally

CONFLICT OF INTERESTS

Declared none

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