



Restructuring Pharmaceutical Education for Next Generation Pharmacist: A Survey Report

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Research Article

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Abstract

In recent past, particularly in the last decade or so, concern for quality of pharmaceutical education in India has been on the increase. There is a growing concern about the future of pharmaceutical education and it being affected by sweeping changes in the global economy. These changes require a restructuring of pharmaceutical education to provide knowledge and learning to new pharamatachnocrat. Through this paper an effort is made to suggest some proposes points that may be implemented to reforms the pharmaceutical education. The propose parameters that would enhance the status and development of pharmaceutical education in India was discussed with the 300 students of B.Pharm degree level from four pharmacy colleges of Punjab. On the basis of data obtained, it was concluded that these restructuring is highly essential to meet up the future requirement of pharmaceutical educations in the era of globalization & liberalization.

Keywords: Pharmacy education, Curriculum, Digital technologies, International collaborations, Questionnaire.

Introduction

Pharmacy like every other health care professional is changing rapidly. Almost every aspect of its knowledge and practice base is affected by external change-technological developments, changing patient expectation, new professional governance's requirements, and developments in other professions. The pharmacy education in our country has witnessed tremendous expansion in last one decade. Now we have today over 600 pharmacy colleges with annual intake of

over 60,000 students at Diploma, Bachelor and Master level [1]. However, the standard in pharmacy education has been eroded by rising tides of mediocrity. There is a growing concern about the future of pharmaceutical education in India and it being affected by sweeping changes in the global economy [2-3]. Moreover qualities of pharmacy education imparted by our institution have everlasting impact on quality of health care offered to our society [4]. There is an urgent need to initiate an academic exercise aimed at attaining revamping of curriculum, keeping in pace with current and emerging trends in the field of pharmacy. Any delay on our part in meeting present and future requirements of pharmacy curriculum will be acutely felt by the coming generations of our students. On the continuation of our work for the progress of pharmacy profession [5], in the present work various suggestions have been made supported by students' survey in the form of simple questionnaire. This study explored the experiences and expectations of B. Pharmacy students of pharmacy education as a prelude for designing revised and advanced pharmacy education.

SUGGESTIONS

Regarding this some of the solutions and suggestions such as modification of syllabus, computer aided pharmacy education and digital technological teaching methods should be implemented. Digital technologies and other methods such as video lectures and tele conferences can be used. AICTE/PCI should work in the establishment of separate pharmaceutical universities in views of proper planning and co-ordinate development of the pharmacy education system. An interaction between industry-academic institutions is a matter of great relevance in the present context of globalization of pharmaceutical education. Six months industrial training and three months hospital training must be mandatory for all the students at the degree level. Regular revision of the practical curriculum keeps pace with the emerging trends in the pharmacy field. Notable elements of quality education are the quality of students being admitted, qualification of the teachers, quality of teaching, laboratory training,



examination pattern and research activities. That will enhance by all India Entrance examination for Pharmacy and conduction of seminars, refresher course, workshops etc for teachers.

Material and Method

Giving Special Status to Pharmacy Course

- Establishment of Separate Pharmaceutical University in every state.
- All India entrance examination for admission in pharmacy course.

Need for Change: Modification of Syllabus

- Marketing course should be included which also contains atleast one month field training.
- Teaching of cellular/molecular biology in depth that will help in growing cell lines so vital to in-vitro testing of drugs.
- Introduction of regulatory affairs and patent filing course at the graduate level.
- Deletion of certain topics like trigonometry, coordinate geometry, Laplace etc in maths as they are not of much use in pharmacy.

Implementation of Computer Aided Pharmacy Education

- Introduction of graphical representation and mathematical calculations in biopharmaceutical complexities by computer aided programming.
- Digital technologies with computer aided learning by software like CHEMWINDOW, STAT- 100, and PCCA etc.
- Digital libraries in which software like SIGMAPLOY is used for data analysis.

Implementation of Digital Technological Teaching Methods

- Video-lectures:-from Eminent persons in the field of pharmaceutical education and in industry.
- Tele-conferences:-although not very popular in India so far but such conferences will enable students to ask questions from eminent people anywhere in the world.

Industry–Institute Interaction

- Introduction of six month training should be mandatory after sixth semester.
- Industry experts should be associated as guest faculty so that students as well as faculty member should get exposure to industrial environments.
- Collaboration with Industry should be mandatory for the colleges so that industry invest time, money, equipment and technology in pharmacy colleges so that in return, a finished product (read student) fit for the industry will produce.

Enhancement of Faculty Teaching Skills

- Organizing and participating in professional development activities like seminar, refresher course and workshop.
- High level training should be organised in collaboration with industry for teachers.

- Encouragement should be given to pharmacy teachers to attend international conferences and visit abroad.

Transformation of Practical Curriculum

- Proper balance should be maintained between patient and industry oriented practical courses.
- Three month hospital training should be organized to better understand the subject of pharmacology.

Collaboration with Foreign Pharmaceutical Institute

- International exchange and cooperation in pharmaceutical education should develop.
- The statutory bodies such as UGC, AICTE, PCI etc should encourage international cooperation and networking among institutions.

Results and Conclusion

With the above mentioned parameters, a survey was conducted with 300 students of Pharmacy Colleges of different districts of Punjab (Roper, Patiala, Amritsar and Gurdaspur) to reveal their views about all the above parameters. According to data obtained (**Table 1**), it was observed that 70% of students want that an all India entrance exam should be held for the admission to the pharmacy courses to upgrade the standard of pharmaceutical education. Around 75% of the students want to implement high tech digital and computer aided education to make budding pharmacist more skilled to suit the modern environment. 58% of the students want that cellular biology/biotechnology/microbiology would be taught in-depth. The knowledge of these subjects will help in growing cell lines so vital in in vivo and in vitro testing of drugs. Only 24% of the student feel that pharmacy education should be more patient care/pharmacy practice oriented rather than industry oriented. About 95% of students feel that three month summer training should be organized so that students get familiar to the working of various equipments. Around 76% of students require the updating of the B. Pharmacy syllabus. Students feel that advanced mathematics should be deleted from the syllabus to reduce the overburdening. 78% of students feel that computer should be taught in more elaborated manner. Only 36% of the students feel that six month hospital training should be organized. A minority of students i.e. (25%) feel that there should be a separate pharmaceutical university establishment in every state. About 62% of the students feel that seminar and conferences should be organized with the community to clear the illusions about the pharmaceutical profession.



Table 1

z	Questions	Yes (%)	No (%)	Can't Say (%)
1.	Do you want that All India Entrance exams should be held for admission to the pharmacy courses?	70%	30%	---
2.	Do you want the implementation of high tech digital and computer aided education?	75%	25%	---
3.	Do you want the in-depth teaching of cellular biology/biotechnology/microbiology?	58%	27%	15%
4.	Do you want the pharmacy education should be more patient care/pharmacy practice oriented rather than industry oriented?	24%	76%	---
5.	Do you want that three month summer industrial camp/training should be organized?	95%	5%	---
6.	Do you want any introduction/deletion of certain topics in B. Pharmacy syllabus?	76%	24%	---
7.	Do you want that six month hospital training should be organized?	36%	52%	12%
8.	Do you want that a separate pharmaceutical university should be established in every state?	25%	55%	20%
9.	Do you want that seminar conferences with community should be organized?	62%	23%	15%
10.	Do you want that computer education should be taught in more elaborated manner throughout B. pharmacy curriculum?	78%	12%	10%

Conclusion

As the tidal waves of change are gathering force at the foreseeable horizon and are likely to surge forward with great speed and thrust, we take note of these moments of change and prepare our boats to withstand the same. If we move with the waves we may be sailing towards an advanced future, If we donot, we are sure to get tumbled culminating in disarray & disorganizations, choice is ours. These are changes we need in Pharmaceutical education to develop and strengthen the profession for this millennium. On the basis of survey and data obtained, it was concluded that these restructuring is highly essential to meet up the future requirement of pharmaceutical educations in the era of globalization & liberalization.

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AUTHORS' CONTRIBUTIONS

Authors contributed equally to all aspects of the study.

PEER REVIEW

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests.