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DOCTOR OF PHARMACY IN INDIA: SCOPE AND PROFESSIONAL CHALLENGES

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ABSTRACT
Pharmacy Council of India (PCI) approved 22 colleges to start Pharm D course for the academic year 2008-09 throughout India. As on today there are 4050 Pharm D students and 590 Pharm D (Post Baccalaureate) students in a total of 52 colleges. Pharmacy education in India is set to undergo a sea change in the next few years with the introduction of Pharm D and dream role of clinical pharmacist in the health care system. A thorough search of literature was carried out and critically compared the recently introduced Pharm D course with the same of other countries. The Pharm D is meant for creating practicing pharmacists and is similar to a programme in the United States. The main goal behind introducing Pharm D programme is to put the pharmacy education in heights and to provide better services to the citizens on health needs.

Keywords: *Pharm D; Pharmacy Education; Clinical Pharmacist.*

INTRODUCTION

Indian pharmaceutical education introduced Pharm D or Doctor of Pharmacy one of the new courses. Pharmacy is considered as the field that leads the community towards a healthy life. The Pharm D is meant for creating practicing pharmacists and is similar to a programme in the United States. It was akin to Doctor of Medicine (MD) for doctors and Doctor of Dental Sciences (DDS) for dentists. The Pharm D was different in its course content from the undergraduate B. Pharm and the postgraduate M Pharma courses. The conventional B. Pharm was an all-embracing course with footprints in the industry, teaching, research and community pharmacy. However, it was more oriented towards pharmaceutical industry than clinical practice. This lacuna would be fulfilled by the Pharm D programme. The idea is to educate and train pharmacy students in India to meet the shortage of pharmacists in Indian hospitals and also to match the entry-level PharmD curriculum in the United States. The National Association of Boards of Pharmacy (NABP) new requirement that a foreign pharmacy graduate have 5 years of pharmacy education before applying to take the Foreign Pharmacy Graduate Equivalency Examination (FPGEE) in order to then take the North American Pharmacist Licensure Examination (NAPLEX) and finally obtain a license to practice pharmacy in the United States is the key reason for this change in pharmacy education in India.[1] The main goal behind introducing Pharm D programme is to put the pharmacy education in heights and to provide better services to the citizens on health needs. On similar lines, recently Pharmacy Council of India (PCI) has taken a decision to introduce Pharm D or Doctor of pharmacy programme here in India in order to improve India's healthcare system. This programme has also been approved by the Government of India. The Course Content of the Pharm D includes the whole syllabus of B. Pharm course subjects in first three years theory and practical hours and for the next two years the major subjects like Pharmacotherapeutics, Biopharmaceutics & Pharmacokinetic, Biostatistics & Research Methodology, Clinical Toxicology, Clinical Pharmacy, Hospital Pharmacy, Clinical Research, Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring, Pharmacoepidemiology and Pharmacoeconomics. Project work: During 5th year (Six Months) and Internship or residency for one year in multi specialty teaching hospital. The duration of this course is six years. The period of six years is divided into two Phases. Phase I – consisting of First, Second, Third, Fourth and Fifth academic year. Phase II – consisting of internship or residency training during sixth year involving posting in specialty units of hospitals.[2]

A key factor in developing competence is the continual learning of new knowledge and the enhancement of critical thinking and problem solving skills through practice. The main focus is on efficient patient care, which can be achieved by segregating the specific job responsibilities to the expert professionals. By introducing the new generation clinical pharmacists the work load of the physicians will get reduced, so that the physician can focus his attention more on the diagnosis rather than Pharmacotherapeutics and thus, providing the significance for clinical pharmacists in India. Pharmacy graduates are often able to competently perform basic clinical services such as

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routine patient counseling, provision of drug information, targeted drug monitoring etc.

STATISTICS OF PHARM D PROGRAMME IN INDIA

PCI approved 22 colleges to start Pharm D course for the academic year 2008-09 throughout India (Table 1). According to rules and regulations given by the PCI, the institutions which are starting the Pharm D course should provide 300 bed hospital facilities.[3]

Table 1: *Statistics of Pharm D Programme in India*

Courses	Duration	No Students			Total No Students	Total No Colleges
		1st batch 2008	2nd batch 2009	3rd batch 2010		
Pharm D	6years	810	1290	2010	4050	52
PharmD (Post baccalaureate)	3years	90	210	290	590	

NEED OF PHARM D PROGRAMME IN INDIA

Indian population has crossed 1.2 billion with an exponentional rise of 35-45 million population added every year. Most of the Indian population is rural based, illiterates with little or no adequate basic amenities including health care facilities. Due to this reason, majority of the population is suffering from various health problems including malnutrition disorders, maternal and infant deaths, thus, various government health programs failed to provide net results. While in the cities, people are little educated having number of social habits such as smoking and drinking etc., and becoming slaves and are responsible for their family disorganization and its consequences on the society. In the Indian healthcare system the doctor diagnose and prescribe the medicines, a pharmacist may explain how to take the medicines. The people of India are more dependent on pharmacist rather than a doctor. Along with these, some other following reasons emphasize on the need of pharmacist in the healthcare system and focuses on the development of clinical pharmacy in India.

1. Poor healthcare facilities in the rural areas of the country.
2. Increased awareness of medications in patients leading to self medication. 3. Social and economical factors.
4. Improper implementation of “rational drugs use” policy.
5. Grave shortage of healthcare personnel in healthcare sector.

These reasons necessitate revamping the conventional role of pharmacists in Indian health care sector and hence by producing the world competent Pharm D graduates mainly having knowledge of clinical profession and pharmaceutical care, the above problems can be solved at measurable extent.[4]

The Challenges in the Health Care to be met by Clinical Pharmacy

Health care is incomplete in its delivery if the input of any core health care is absent. The role of clinical pharmacist in the care of hospitalized patients has evolved over time, with increased emphasis on collaborative care and patient interaction. The addition of clinical pharmacist services in the care of inpatients generally results in improved care, with no evidence of harm.[5] Safe and effective medicine use is the core business of clinical pharmacists. With the focus on individual patients, comprehensive and accountable clinical pharmacy services are an essential component of contemporary healthcare practice. By working to ensure that medicine therapy is optimum, safe and cost-effective, the provision of clinical pharmacy services serves the interests of individual patients and also the wider community.[6]

Example 1

A patient with pneumonia was receiving amoxicillin/ clavulanate potassium (1000 mg/ 200 mg every 8 hrs) to treat *Stapphylococcus aureus*. The pharmacist calculated creatinine clearance; it was 12.5 ml/min. The pharmacist gave an intervention to the team. After intervention, the order was changed, based on the renal guideline, to amoxicillin/clavulanate potassium (1000 mg/ 200 mg every 12 hrs). The panel estimated the probability of an Adverse Drug Event.

Example 2

A patient was receiving ceftazidime (1 g every 8 hrs) to treat *Pseudomonas aeruginosa*. Three days later, patient’s renal function was worsening; calculated creatinine clearance was 16.6 ml/min. The pharmacist gave an intervention to the team. After intervention, the order was changed, based on the renal guideline, to ceftazidime (1 g every 24 hrs). The duration of therapy was 7 days. The cost of each 1 g-vial of ceftazidime was Rs. 296. So, the cost for this case is, (Rs. 296 /1 g-vial x 3 times/day x 7 days) – [(Rs. 296/ 1 g-vial x 1 time/day x 4 days) + (Rs. 296/1 g-vial x 3 times/day x 3 days)], Rs. 1776. It means Rs. 1776 decreased or saved by the patient.

SCOPE OF PHARM D GRADUATES [7,8]

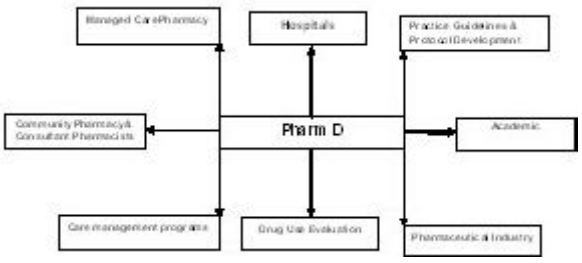

Fig. 1: *Scope of Pharm D Graduates*

Community Pharmacy and Consultant Pharmacists

Pharmacists serve patients and the community by providing information and advice on health, providing medications and associated services, and by referring patients to other sources of help and care, such as physicians, when necessary. Likewise, advances in the use of computers in pharmacy practice now allow pharmacists to spend more time educating patients and maintaining and monitoring patient records. As a result, patients have come to depend on the pharmacist as a health care and information resource of the highest caliber. Pharmacists, in and out of the community pharmacy, are specialists in the science and clinical use of medications. They must be knowledgeable about the composition of drugs, their chemical and physical properties, and their manufacture and uses, as well as how products are tested for purity and strength. Additionally, a pharmacist needs to understand the activity of a drug and how it will work within the body. More and more prescribers rely on pharmacists for information about various drugs, their availability, and their activity, just as patrons do when they ask about nonprescription medications.

If pharmacists develop a desire to combine their professional talents with the challenge of the fast-moving community pharmacy practice, they will often consider a management position within a chain pharmacy practice or ownership of their own pharmacy. In chain practice, career paths usually begin at the store level with possible subsequent advancement to a position at the district, regional, or corporate level. Many chain companies have management development programs in marketing operations, legal affairs, third party programs, computerization, and pharmacy affairs. The spirit of entrepreneurship and motivation has enabled many pharmacists to successfully own their own pharmacies or, through establishing consultation services, own their own pharmacy practices.

Hospitals and Other Institutional Settings

As society's health care needs have changed and expanded, there has been an increased emphasis on provision of care through organized health care settings. As a result, an increased number of pharmacists now practice in hospitals, nursing homes, extended care facilities, neighborhood health centers, and health maintenance organizations. As members of the health care team composed of physicians and nurses, among others, institutional pharmacists have an opportunity for direct involvement with patient care. The knowledge and clinical skills that the contemporary pharmacist possesses make this individual an authoritative source of drug information for physicians, nurses, and patients. In addition to direct patient care involvement, pharmacists in hospitals are responsible for systems which control drug distribution and are designed to assure that each patient receives the appropriate medication, in the correct form and dosage, at the correct time. Hospital pharmacists maintain records on each patient, using them not only to fill medication orders but also to screen for drug allergies and adverse drug effects.

Contemporary hospital pharmacy practice is composed of a number of highly specialized areas, including drug and poison information, and intravenous therapy. In addition, pharmacists provide clinical services in adult medicine, pediatrics, oncology, ambulatory care, and psychiatry. The nature and size of the hospital helps to determine the extent to which these specific services are needed. Because of the diversity of activities involved in pharmacy departments, there is also demand for management expertise, including finance and budgeting, personnel administration, systems development, and planning. As hospital pharmacists continue to become more involved in providing patient-oriented services, the demand for practitioners in this area of pharmacy continues to grow.

Managed Care Pharmacy

Increasingly, pharmacists are employed in various capacities within managed care organizations (MCOs). Managed care is a system designed to optimize patient care and outcomes and foster quality through greater coordination of medical services. MCOs incorporate pharmaceutical care which strives to improve access to primary and preventive care, and ensure the most appropriate and effective use of medical services in the most cost-effective manner. The number of individuals enrolled in managed care programs has risen dramatically in recent years. At the end of 1995, it was estimated that more than 130 million individuals in the U.S. received health care services through some form of managed care. As managed care continues to assume a larger role in our health care system, opportunities for pharmacists practicing in these types of settings are expected to grow.

A managed care pharmacist works for a managed care organization providing a continuum of services to patient and pharmacy-benefit management companies. A managed care pharmacist may play one of many roles within a managed care organization and may be involved in all aspects of the organization. A few of the roles that a managed care pharmacist may hold in a managed care organization are: Cost-analysis – the managed care pharmacist may work to determine the least cost options for effective drug treatment and drug therapy within the guidelines of the managed care organization. Protocol Development – as a protocol developer the managed care pharmacist may work with physicians and researchers to develop and write protocols for administering various drugs and drug therapies. Medication Reviews – the managed care pharmacist may be required to complete ongoing research on the current reviews of drugs and drug therapies both within the HMO and from outside

sources. Managed care pharmacists should play a more active role in medication error-reduction activities by improving the patient education process and in assisting the pharmacy community in its goal of improving patient safety.

Practice Guidelines and Protocol Development
Clinical Pharmacists often work directly with physicians and other care givers to determine which medical treatments, including which drug therapies, are most effective in enhancing patient outcomes. That can involve regularly reviewing medical literature to determine which medications are the safest and most effective for treating certain diseases, gathering data from the plan's patient population, and performing analyses based on that research.

Drug utilization review/drug use evaluation
Clinical pharmacists review drug utilization to determine which patients and prescribers are using particular medications. This allows the pharmacist to determine whether some drugs are inappropriately prescribed or used. With this knowledge in hand, the pharmacist and other care providers can then actively intervene in the patient's care process to assure better outcomes.

Care management programs
Often called "disease management programs," these programs involve having pharmacists, physicians, case managers and other care givers work together to effectively manage and coordinate the overall care of patients who are at high risk of serious complications because of certain disease states. For example, a care management program might identify all diabetic patients within a certain plan population, and then place special emphasis on making sure those patients receive regular education and counseling about their disease, including how and when to take their medications. Pharmacists might then interact with the patient and the patient's physicians on a regular basis to try to keep the patient as healthy as possible.

The Pharmaceutical Industry
Another career option in pharmacy is represented by the pharmaceutical industry which produces chemicals, prescription drugs, and other health products. Pharmacists do such things as marketing, research and product development, quality control, sales, and administration. Many pharmacists go on to obtain postgraduate degrees in order to meet the technical demands and scientific duties required in pharmaceutical manufacturing. Pharmacists with an interest in sales and administration can combine this with their technical background in pharmacy by serving as medical service representatives. These representatives call on a variety of health care professionals to explain the uses and merits of the products their firms produce. Experienced and successful medical service representatives with administrative abilities often rise to supervisory or executive posts in the pharmaceutical industry. Pharmacists are also employed as sales representatives, supervisors, and administrators in wholesale drug firms.

Academic Pharmacy
Pharmacy practice faculty have significant responsibility for patient care, in addition to their work in teaching and research. These academicians often are called educator/ practitioners, and they serve as role models for pharmacy students and residents in many education/practice settings. Faculties in disciplines of pharmacy practice usually are involved in clinical research. The clinical scientists are mainly concerned with research that includes sophisticated instrumentation and analytical methods that study all aspects of drugs and drug products. Moreover, social, economic, and behavioral science research often uses survey methods and statistical analyses to solve complex problems of drug utilization management, health care delivery, marketing, management, and other practice issues. To paraphrase one current pharmacy faculty member, "Perhaps no other job in pharmacy has such far-reaching effects on the profession as that of an educator. It is in academia that one can excite individuals about pharmacy and lay the groundwork for continuing advances in the field."

PROFESSIONAL CHALLENGES

1. Acceptance by the healthcare professionals is required as they may feel that pharmacist infringe into their territory.
2. To get acceptance pharmaceutical care services like drug therapy monitoring, ADR monitoring, dosage adjustment, patient counseling, drug information, Medication error management etc., need to be practiced.
3. Involvement of policy makers, professional bodies, stake holders, educational institutions, etc, need to be ascertained.
4. Key competency levels need to be practiced in all settings with equal importance so that there is no variation in the competency levels of Pharm D professionals coming out from various institutions
5. Training the trainers is very important.
6. As it is difficult to be accommodated in the ward (All 40 students),as other interns and paramedical people also come for rounds, simulated cases need to be done for which a standard should be developed
7. Integration of subjects needs to be done by the preceptors.

8. Government job opportunities need to be created.
9. Fear of decline of other courses like B. Pharm, M. Pharm (PP) .
10. After finishing the course acceptance, approval & recognition by council of other countries to practice in their settings.
11. Updating through exams in future as in other countries has to be framed to continue the registration.

CONCLUSION

We can conclude that pharmacy education in the country is set to undergo a sea change in the next few years. To provide leadership direction and experts in planning, development, implementation and evaluation of monitoring systems in hospital, Clinical and community pharmacy settings and to assure the delivery of consistently high quality pharmacy practice services through Pharm D professionals.

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