



Pharm. D: New Born Course in India

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Review Article

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Abstract

A doctor of pharmacy degree program must have a multidisciplinary curriculum that produces pharmacist with best pharmaceutical care. In India, there has been a surge in the number of institutions offering practice based Pharm. D program which was started in 2008. Pharm. D candidates need to work hard and get recognized in the society for patient care by clinical pharmacy services. The information presented in this paper highlights its regulation, duration, syllabus structure, colleges, scope, utility and practice. So, with the Pharm.D clinically oriented program coming in, it will take some years for the clear picture to emerge with regard to producing manpower to solely engage in pharmacy practice and research.

Keywords: Pharm.D, Post Bacculaureate, Pharmacy Practice.

Introduction

In India, the first batch of Pharm.D took admission in 2008. The Pharm. D candidates will be passed in 2014 and Pharm.D(P.B) candidates already passed in 2011^[1]. The pharmacists can provide clinical pharmacy services such as medication history interview, participation in wards rounds and meetings, provision of drugs/poison information, prevention with assessment and management of drug interactions, adverse drug reaction management (ADR), medication order review, therapeutic drug monitoring (TDM), selection of drug therapy, patient medication counselling, liaison with community services etc. In hospital, Pharm.D candidates may give better

services than pharmacy graduates because Pharm.D candidates too much skilled than others with better pharmacy practice and clinical pharmacy potentials^[2].

Pharm. D Regulation 2008^[3]

The regulations framed under section 10 of the Pharmacy Act, 1948(8 of 1948) which is approved by the Government of India, Ministry of Health and notified by the Pharmacy Council of India. In exercise of the powers conferred of section 10 of the Pharmacy Act, 1948 (8 of 1948), the pharmacy council of India, with the approval of the central government hereby makes some regulations such as:

- Pharm. D shall consist of a certificate, having passed the course of study and examination as prescribed in these regulations, for the purpose of registration as a pharmacist to practice the profession under the pharmacy Act, 1948.
- Duration of the course i.e.: Pharm.D and Pharm.D (Post Bacculaureate) with minimum qualification, course of study.
- Practical training and project work.

Course Structure and Admission Criteria^[3,4]

Pharm. D course shall be six academic years full time with each academic year spread over a period of NLT 200 working days. The first to fifth year is academic year and sixth involving posting in specialty units. The minimum qualification for admission to-

- i. 10+2 examination with physics and chemistry as compulsory subjects along with Mathematics or Biology.
- ii. A pass in D. Pharm course from an institution approved by Pharmacy Council of India under section 12 of the Pharmacy Act.



- iii. Any other qualification approved by the Pharmacy Council of India as equivalent to any of the above examinations.

A student should complete the age of 17 years on or before 31st December of the year of admission to the course.

- Pharm. D (Post Bacculaureate) course shall be three academic year spread over a period of NLT 200 working days. This course shall be started from fourth year and continued up to sixth year which is as same as Pharm.D.

The minimum qualification for admission to:

- A pass in B.Pharm from an institution approved by pharmacy council of India under section 12 of the Pharmacy Act.
- Number of admission in each academic session are in the following:

Pharm. D: 30 students

Pharm. D (Post Bacculaureate): 10 students

- Under the regulations, which institutions running B.Pharm approved under section 12 of the pharmacy Act, will only be permitted to run Pharm.D Pharm.D (P.B) program will be permitted only in those institutions which are permitted to run Pharm.D.

- The first year courses include the subjects (theory and practical): Human Anatomy and Physiology, Pharmaceutics, Medicinal Biochemistry, Pharmaceutical Organic Chemistry, Pharmaceutical Inorganic Chemistry, Remedial Mathematics and Biology.

- The second year theory courses are Pathophysiology, Pharmacology –I and Community Pharmacy and courses include the subjects (theory and practical): Pharmaceutical Microbiology, Pharmacognosy and Pytopharmaceuticals, Pharmacotherapeutics-I.

- The third year theory course is Pharmaceutical Jurisprudence and courses include the subjects (theory and practical): Pharrmacology-II, Pharmaceutical Analysis, Pharmacotherapeutics- II, Medicinal Chemistry, and Pharmaceutical Formulations.

- The fourth year theory courses are Biostatistics and Research Methodology and Clinical Toxicology and courses include the subjects (theory and practical): Pharmacotherapeutics- III, Hospital Pharmacy, Clinical Pharmacy, Biopharmaceutics and Pharmacokinetics.

- The fifth year theory courses are Clinical Research, Pharmacoepidemiology and Pharmacoconomics, Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring. The clerkship also include the course which the students attending ward rounds on daily basis.

- The sixth year consists of internship in minimum 500 bedded hospital or residency training including postings in specialty units. Students should independently provide the clinical pharmacy services to the allotted wards.

- i. Six months in general medicine departments.
- ii. Two months each in three other specialty departments (Surgery, Pediatrics, Gynecology and Obstetrics, Psychiatry, Skin and VD, Orthopedics).

- Examination: The examination shall be of written and practical (including oral nature). Each examination may be held twice every year. The first examination in a year shall be the annual examination and the second examination shall be supplementary examination.

Qualification for Faculty Member ^[3]

As per regulations; Professor, Assistant Professor, Lecturer posts are given under five departments, The departments are Pharmaceutics (Professor: 01, Asst. Professor: 01, Lecturer: 02); Pharmaceutical Chemistry including Pharmaceutical Analysis (Professor 01, Asst. Professor: 01, Lecturer: 03); Pharmacology (Professor:01, Asst.Professor: 01, Lecturer: 02) Pharmacognosy (Professor 01, Asst. Professor: 01, Lecturer: 01) Pharmacy Practice (Professor:01, Asst.Professor: 02, Lecturer: 03) . The workload of faculty: Professor (8 hours per week), Assistant Professor (12 hours per week), Lecturer (16 hours per week). All faculties shall be full time. However, Part time preceptors in hospital shall be allowed.

Table-01: Subject wise specialization of the Teaching Staff ^[4]

S. No.	Subject	Specialization Required
1.	Pharmacy Practice	M.Pharm in Pharmacy Practice or Pharmacology or Pharmaceutics.
2.	Human Anatomy & Physiology	M.Pharm in Pharmacology or Pharmacy Practice
3.	Pharmaceutics (Dispensing & General Pharmacy)	M.Pharm in Pharmaceutics



4.	Pharmacognosy-I	M.Pharm in Pharmacognosy
5.	Pharmaceutical Organic Chemistry-I	M.Pharm in Pharmaceutical chemistry or Pharmaceutical Analysis or Quality Assurance or Bulk Drug
6.	Pharmaceutical Inorganic Chemistry	M.Pharm in Pharmaceutical Chemistry or Pharmaceutical Analysis or Quality assurance or Bulk Drug
7.	Pharmaceutical microbiology	M.Pharm in Pharmaceutics or Pharmaceutical Biotechnology
8.	Pathophysiology	M.Pharm Pharmacy Practice or Pharmacology
9.	Applied Biochemistry & Clinical Chemistry	M.Pharm in Pharmacology or Pharmacy Practice or Pharmaceutical Chemistry
10.	Pharmacology-I	M.Pharm in Pharmacology or Pharmacy Practice
11.	Pharmaceutical Jurisprudence	M.Pharm in Pharmaceutics
12.	Pharmacology-II	M.Pharm in Pharmacology or Pharmacy practice
13.	Pharmaceutical Dosage Forms	M.Pharm in Pharmaceutics or Industrial Pharmacy
14.	Pharmacotherapeutics –I, II and III	M.Pharm Pharmacy Practice or Pharmacology
15.	Community Pharmacy	M.Pharm in Pharmacy Practice or Pharmacology or Pharmaceutics
16.	Hospital Pharmacy	M.Pharm in Pharmacy Practice or Pharmacology or Pharmaceutics
17.	Clinical Pharmacy	M.Pharm in Pharmacy Practice
18.	Computer Science or Computer Application in pharmacy	MCA
19.	Mathematics	M.Sc. (Maths)

Table-02: Prescribed qualifications and experience for Professor, Assistant Professor, Lecturer and others

SN.	CADRE	QUALIFICATIONS	EXPERIENCE
1.	Lecturer	i) Basic degree in pharmacy (B.Pharm). ii) Registration as a pharmacist under the Pharmacy Act. iii) First Class Master's degree in appropriate branch of specialization in Pharmacy (M.Pharm)	No minimum requirement.
2.	Assistant Professor	i) Basic degree in pharmacy (B.Pharm). ii) Registration as a pharmacist under the Pharmacy Act. iii) Master's degree in appropriate branch of specialization in Pharmacy (M.Pharm) iv) Ph.D. degree (with First Class degree either at Bachelor's or Master's level) in the appropriate branch of specialization in Pharmacy.	Three years experience in Teaching or Research at the level of Lecturer or equivalent.
3.	Professor	Basic degree in pharmacy (B.Pharm). ii) Registration as a pharmacist under the Pharmacy Act. iii) Master's degree in appropriate branch of specialization in Pharmacy (M.Pharm). iv) Ph.D. degree (with first Class either at Bachelor's or Master's level) in appropriate branch of specialization in	Ten years experience in Teaching or Research. ii) Out of which five years must be as Assistant Professor.



		Pharmacy.	
4.	Director or Principal or Head of institute	Basic degree in pharmacy (B.Pharm). ii) Registration as a pharmacist under the Pharmacy Act. iii) Master's degree in appropriate branch of specialization in Pharmacy (M.Pharm) iv) Ph.D. degree (with first Class degree either at Bachelor's or Master's level in the appropriate branch of specialization in Pharmacy.	Fifteen years experience in Teaching or Research. ii) Out of which five years must be as Professor or above in Pharmacy. Desirable : Administrative experience in responsible position. The maximum age for holding the post shall be 65 years.

If a class or division is not awarded at Master's level, a minimum of 60% marks in aggregate or equivalent cumulative grade point average shall be considered equivalent to first class or division, as the case may be.

Clarification of Pharm.D / Pharm. D (P.B)

Pharm.D and Pharm.D (Post Baccalaureate) qualification from an institution approved by the PCI U/S 12 of the Pharmacy Act 1948 is an approved qualification for teaching D.Pharm , B.Pharm,M.Pharm, Pharm.D/Pharm.D (Post Baccalaureate) courses. As such a candidate holding these degrees from an institution approved by the PCI u/s 12 of the pharmacy Act, 1948 shall be eligible for consideration for teaching posts at appropriate level in pharmacy institutions. Pharm.D is a post graduate qualification and passed out students can directly register for Ph.D.

The Pharm .D and Pharm .D (P.B) Colleges in India which are in the following:

Table- 03: Pharm.D and Pharm.D (P.B) Colleges in India ^[3, 5]

State	Name of the Institutions	Courses
Andhra Pradesh	Smt.Sarojini Ramulamma College of Pharmacy, Seshadrinagar, Mahbubnagar-509 001.	Pharm.D , Pharm.D (Post Baccalaureate)
Andhra Pradesh	Raghavendra Institute of Pharmaceutical Education and Research(RIPER) ,KR Palli Cross, Cheyyedu Anantapur-515 721.	Pharm.D , Pharm.D (Post Baccalaureate)
Andhra Pradesh	Deccan School of Pharmacy,Zafargarh,P.O. Kanchanbagh, Hyderabad-500 058.	Pharm.D

Andhra Pradesh	Talla Padmavathi College of Pharmacy, Orus-Kareemabad, Warangal-506 012	Pharm.D , Pharm.D (Post Baccalaureate)
Andhra Pradesh	Bharat Institute of Technology, Mangalpalli (Vill),Ibrahimpattanam(Mandal),R.R.Distt.-501 510 (Andra Pradesh)	Pharm.D , Pharm.D (Post Baccalaureate)
Andhra Pradesh	St. Peter's Institute of Pharmaceutical Sciences,# 2-4-1211 Vidyanagar, HANAMKONDA-506 001	Pharm.D , Pharm.D (Post Baccalaureate)
Andhra Pradesh	Sri Venkateshwara College of Pharmacy,86. Hitech City Road, Madhapur, Hyderabad-500 081.	Pharm.D , Pharm.D (Post Baccalaureate)
Andhra Pradesh	GIET School of Pharmacy, NH-5, Chaitanya Nagar, Rajahmundry-533 294, EG District.	Pharm.D
Andhra Pradesh	Malla Reddy College of Pharmacy, Malsammaguda, Dhullapally(Post Via Hakimpet), Secunderabad- 500 014.	Pharm.D , Pharm.D (Post Baccalaureate)
Andhra Pradesh	Vaagdevi College of Pharmacy, H.No. 2-2-457/3 , Ramnagar,Hanmakonda, Warangal-506 001.	Pharm.D , Pharm.D (Post Baccalaureate)
Andhra Pradesh	P.Rami Reddy Memorial College of Pharmacy, 1-35, Prakruthi Nagar,Utukur, Kadapa-516 003.	Pharm.D , Pharm.D (Post Baccalaureate)
Andhra Pradesh	Chalapathi Institute of Pharmaceutical Science , Chalapathi Nagar, Lam, Guntur- 522 034.	Pharm.D
Andhra Pradesh	Annamacharya College of Pharmacy, New Boyanpalli, Rajampet- 516 126 Kadapa Distt.	Pharm.D
Andhra Pradesh	KVSR Siddhartha College of Pharmaceutical Sciences, Siddhartha Nagar, Vijayawada.	Pharm.D
Andhra Pradesh	Malla Reddy Institute of Pharmaceutical Sciences, Malsammaguda, Dhullapally(Post Via Hakimpet), Secunderabad- 500 014.	Pharm.D , Pharm.D (Post Baccalaureate)
Andhra Pradesh	AU College of Pharmaceutical Sciences, Andhra University, Vishakhapatnam.	Pharm.D
Andhra Pradesh	Aditya Institute of Pharmaceutical Sciences and Research, Aditya Nagar, Surampalem;A.D.B.	Pharm.D



	Road, Peddapuram, East Godavari Distt. 533 437.	
Andhra Pradesh	MESCO College of Pharmacy, Hyderabad.	Pharm.D
Andhra Pradesh	A.S.N Pharmacy College, Burripalem Road, Nelapadu, Tenali- 522 201, Guntur.	Pharm.D
Andhra Pradesh	CMR College of Pharmacy, Kandlakoya, (V) , Medchal Road, Hyderabad -501 401.	Pharm.D
Andhra Pradesh	G. Pulla Reddy College of Pharmacy, Mehdiapatnam, Hyderabad-500 028.	Pharm.D
Andhra Pradesh	Sri Padmavathi School of Pharmacy, Mohan Gardens, Behind R.K. Kalyanamandapam Vaishnavi Nagar, Tiruchanoor, Chittoor(dt.)-517 503 (Andhra Pradesh).	Pharm.D
Andhra Pradesh	Shri Vishnu College of Pharmacy, Vishnupur, Bhimavaram, West Godavari Distt (Andhra Pradesh).	Pharm.D
Andhra Pradesh	Hindu College of Pharmacy, Amaravathi Road, Guntur-522 002 (Andhra Pradesh).	Pharm.D
Andhra Pradesh	Lalitha College of Pharmacy, Venkatapur (V), Ghatkesar (M), R.R. Distt. (Andhra Pradesh).	Pharm.D
Andhra Pradesh	Care College of Pharmacy, Oglapur (V) , Atmakur (M), Distt. Warangal (Andhra Pradesh).	Pharm.D
Andhra Pradesh	Vagadevi Institute of Pharmaceutical Sciences, Bollikunta, Village Warangal 506 005 (Andhra Pradesh).	Pharm.D
Andhra Pradesh	Creative Educational Society, College of Pharmacy, N.H.7, Chinnatekur Kurnool 518 218 (Andhra Pradesh).	Pharm.D
Andhra Pradesh	Chebrolu Hanumalah Institute of Pharmaceutical Sciences, Chandramoulipuram, Chowdavararam, Guntur 522 019 (Andhra Pradesh).	Pharm.D
Andhra Pradesh	Shree Dattha Institute of Pharmacy, Nagarjuna Sagar Road, Sheriguda(V) , Ibrahimpatnam (M), R.R. Dist 501 510 (Andhra Pradesh).	Pharm.D

Karnataka	M.S. Ramalah College of Pharmacy, M.S. Ramalah Nagar, M.S.R.I.T. Post, Bangalore-560 054.	Pharm.D
Karnataka	Novodaya Education Trust's N.E.T., Pharmacy College, P.B. No. 26, Mantralayam Road, Raichur-584 101.	Pharm.D , Pharm.D (Post Baccalaureate)
Karnataka	HKES's Matoshree Taradevi Rampure, Institute of Pharmaceutical Sciences, Gulbarga.	Pharm.D , Pharm.D (Post Baccalaureate)
Karnataka	Sri Jagadguru Mallikarjuna Murugarajendra College of Pharmacy, Chitradurga-577 502.	Pharm.D , Pharm.D (Post Baccalaureate)
Karnataka	B.V.V. Sangha's Hanagal Shri Kumareswar College of Pharmacy, Bagalkot-587 101.	Pharm.D , Pharm.D (Post Baccalaureate)
Karnataka	Visweswarapura Hanumalah Institute of Pharmaceutical Sciences, 24 th Main, Opp. BDA Complex, B.S.K. 2 nd stage, Bangalore-560 070.	Pharm.D , Pharm.D (Post Baccalaureate)
Karnataka	J.S.S. College of Pharmacy, Sri Shivarathreshwara Nagar, Mysore - 570 015	Pharm.D , Pharm.D (Post Baccalaureate)
Karnataka	Manipal College of Pharmaceutical Sciences, Manipal University, Madava Nagar, Manipal - 576 104, Udupi District..	Pharm.D , Pharm.D (Post Baccalaureate)
Karnataka	Sri Adichunchanagiri College of Pharmacy, B.G. Nagara - 571 448, Nagemangale Taluk, Tq. Mandye Distt.	Pharm.D , Pharm.D (Post Baccalaureate)
Karnataka	Bapuji Pharmacy College, Shamanur Road, S.S. Layout, Davangere - 577 004	Pharm.D
Karnataka	B.L.D.E.A's College of Pharmacy, Post Box No.40, BLDE University Campus, Solapur Road, Bijapur - 586 103	Pharm.D , Pharm.D (Post Baccalaureate)
Karnataka	The Oxford College of Pharmacy, 1st Phase, J.P. Nagar, C.A. Site No.40, Bangalore - 560 078	Pharm.D , Pharm.D (Post Baccalaureate)
Karnataka	PES College of Pharmacy, 50 Feet Road, Hanumanthnagar, Bangalore - 560 050	Pharm.D , Pharm.D (Post Baccalaureate)
	Krupanidhi College of	



Karnataka	Pharmacy, Chikkabelandur, Carmelaram Post, Varthur Hobli, Bangalore - 560 035	Pharm.D , Pharm.D (Post Baccalaureate)
Karnataka	Acharya & B.M. Reddy College of Pharmacy, Soladevanahalli Hesaragatta Road, Chikkabanawara Post, Bangalore-560 090.	Pharm.D , Pharm.D (Post Baccalaureate)
Karnataka	Bharathi College of Pharmacy, K.M. Doddi (P.O.), Maddur Tq, Mandya Dt - 571 422	Pharm.D
Karnataka	Karnataka College of Pharmacy, #33/2, Thirumena Halli, Hedge Nagar Main Road, Bangalore - 560 064	Pharm.D
Karnataka	Al-Ameen College of Pharmacy, Hosur Road, Near Lal Bagh Main Gate, Bangalore 560 027.(Karnataka)	Pharm.D , Pharm.D (Post Baccalaureate)
Karnataka	Aditya Bangalore Institute for Pharmacy Education & Research Bangalore Formally Known As - (Bangalore Institute for Pharmacy, Education & Research (Bipper), No.12, Kogilu Main Road, Yelahanka, Bangalore 560 064 (Karnataka))	Pharm.D
Karnataka	V.V. Sangha's T.V.M. College of Pharmacy, Kappagal Road, Y. Nagesh Shastry Nagar, Gandhinagar, Bellary- 583 103 (Karnataka)	Pharm.D
Karnataka	Karavali College of Pharmacy, NH-13, Vamanjoor, Mangalore - 575 028	Pharm.D
Karnataka	Nargund College of Pharmacy, Dattatreyanagar, 2nd Main 100 Ft. Ring Road, BSK 3rd Stage, Bangalore (Karnataka)	Pharm.D
Karnataka	East West College of Pharmacy # 63, I Phase, B.E.L. Layout, Bharathnagar, Vishwaneddam Post, off Magadi Road, Bangalore-560 091 (Karnataka)	Pharm.D
Karnataka	NITTE University 6th Floor, K.S. Hegde Hospital Complex Deralakatte, Mangalore- 575 018 (Karnataka)	Pharm.D
	Dayananda Sagar College	

Karnataka	of Pharmacy, Shavige Malleshwara Hills, Kumaraswamy Layout, Bangalore- 560 078 (Karnataka)	Pharm.D
Karnataka	Rajiv Memorial Education Society's College of Pharmacy, Balaji Nagar, Old Jewargi Road, Distt. Gulbarga - 585 102 (Karnataka)	Pharm.D
Karnataka	Sarada Vilas College of Pharmacy, Krishnamurthypuram, Mysore- 570 004 (Karnataka)	Pharm.D
Kerala	Al Shifa College of Pharmacy, Post Poonthavanam, Kizhattur, Perintalmanna, Distt. , MALAPPURAM-679 325	Pharm.D
Kerala	National College of Pharmacy, Manassery P.O. Mukkam, Kozhikode- 673 602.	Pharm.D , Pharm.D (Post Baccalaureate)
Kerala	Amrita School of Pharmacy, Amrita Institute of Medical Sciences, Healthcare Campus, Elammakara PO, Kochi - 682 026.	Pharm.D , Pharm.D (Post Baccalaureate)
Kerala	Pushpagiri College of Pharmacy, Pushpagiri Medicity, Perumthuruthy, P.O., Tiruvalla - 689 107.	Pharm.D
Kerala	Sree Krishna College of Pharmacy & Research Centre, Near Parassala Railway Station (Mulluvila), Parassala P.O., Thiruvananthapuram.	Pharm.D , Pharm.D (Post Baccalaureate)
Kerala	Grace College of Pharmacy, Post: Kodunthirappully 678 004, Palakkad (Dt.) (Kerala)	Pharm.D
Kerala	St.James College of Pharmaceutical Sciences, Medical Academy Chalakudy	Pharm.D
Kerala	Devaki Amma Memorial College of Pharmacy, Chekembra, Pulliparamba P.O., Malappuram (Kerala)	Pharm.D
Madhya Pradesh	Shri Ramnath Singh Instt. of Pharmaceutical Sciences & Technology, Opp. Sitholi Railway Station, Jhansi Road, Sitholi, Gwalior - 474 001.	Pharm.D
Maharashtra	Bharti Vidyapeeth University, Poona College	Pharm.D ,



a	of Pharmacy, Erandwane, Pune - 411 038	Pharm.D (Post Baccalaureate)
Maharashtra	Govt. College of Pharmacy, Amravati Kathora Naka, Near VMV, Amravati - 444 604	Pharm.D
Maharashtra	Govt. College of Pharmacy, Opp. Govt., Polytechnic, Osmanpura, Aurangabad (Maharashtra)	Pharm.D
Punjab	Indo-Soviet Friendship College of Pharmacy, Village Ghal-Kalan NH-95, (Moga-Ferozepur Road) Moga - 142 001	Pharm.D
Tamil Nadu	J.S.S. College of Pharmacy, "ROCKLANDS" P.O. Box No. 20, Ootacamund-643 001 The Nilgiris.	Pharm.D , Pharm.D (Post Baccalaureate)
Tamil Nadu	Sri Ramakrishna Institute of Paramedical Sciences, 395, Sarojini Naidu Road, Coimbatore - 641 044.	Pharm.D , Pharm.D (Post Baccalaureate)
Tamil Nadu	Sri Ramachandra College of Pharmacy, Sri Ramachandra Medical College and Research Institute (Deemed University), 1, Ramachandra Nagar, Porur, Chennai - 600 116.	Pharm.D , Pharm.D (Post Baccalaureate)
Tamil Nadu	VEL's College of Pharmacy, Velan Nagar, P.V. Vaithiyalingam Road, Pallavaram, Chennai - 600 117.	Pharm.D , Pharm.D (Post Baccalaureate)
Tamil Nadu	S.R.M. College of Pharmacy, S.R.M. Nagar, Kattankulathur - 603 203.	Pharm.D , Pharm.D (Post Baccalaureate)
Tamil Nadu	PSG College of Pharmacy, P.B. No. 1674, Peelamedu, Coimbatore-641 004.	Pharm.D , Pharm.D (Post Baccalaureate)
Tamil Nadu	Vinayaka Missions's College of Pharmacy, Yercaud Main Road, Kondappanaickenpatty, SALEM-636 308.	Pharm.D , Pharm.D (Post Baccalaureate)
Tamil Nadu	KMCH College of Pharmacy, Kovai Estate, Kalapatti Road, Coimbatore - 641 035.	Pharm.D , Pharm.D (Post Baccalaureate)
Tamil Nadu	Nandha College of Pharmacy, Koorapalayam "Pirivu", Pitchandampalayam Post, ERODE - 638 052	Pharm.D
Tamil Nadu	J.K.K. Nataraja College of Pharmacy, P.B. No. 151, Natarajapuram, NH-47, (Salem to Coimbatore),	Pharm.D

	Komarapalayam-638 183, Namakkal Dt.	
Tamil Nadu	C.L. Baid Metha College of Pharmacy, Rajiv Gandhi Salai, Thorapakkam, Chennai - 600 097.	Pharm.D
Tamil Nadu	R.V.S. College of Pharmaceutical Sciences, 242-B, Trichy Main Road, Sulur Coimbatore.	Pharm.D
Tamil Nadu	J.K.K. Munirajahh Medical Research Foundation, Annai J.K.K. Sampoorani Ammal College of Pharmacy, Ethirmedi, B.Komarapalayam-638183, Namakkal District.	Pharm.D
Tamil Nadu	Padmavathi College of Pharmacy, Krishnagiri Main Road, Periyanaahalli Post, Dharmapuri 635 205 (Tamil Nadu)	Pharm.D
Tamil Nadu	Swami Vivekanand College of Pharmacy Elayampalayam- 637 205	Pharm.D
Tamil Nadu	Deptt. of Pharmacy, University Institute of Pharmaceutical Technology, Faculty of Engg. & Technology, Annamalai University, Annamalainagar-608 002.	Pharm.D , Pharm.D (Post Baccalaureate)

At a Glance: Foreign Countries Concept about Pharm. D

A Doctor of Pharmacy is a professional doctor degree in pharmacy. In some countries, it is a first professional degree, and a prerequisite for licensing to exercise the profession of pharmacist.

In Africa

The University of Nairobi, Kenya offers a 6 year Pharmacist education program. Presently, The University of Benin, Nigeria Edo State is the only institution offering the Pharm D degree. It is a six year undergraduate program. The Pharm.D program has been available in Tunisia since 2005.

In Asia

The University of Dhaka, Bangladesh took first initiative about Pharm. D. program. On 6 November 2007, an Academic Committee Meeting of the Faculty presided by Professor M. A. Rashid, form a sub-committee to review the Pharm. D. courses of



different universities in USA, Japan, India etc. The sub-committee reviewed the syllabus of the Pharm. D. program of different universities around the world and submitted a proposal on 8 April 2008 to the Dean of the Faculty to upgrade the present 4-year B. Pharm. program to 5-year Pharm. D. program with internship in hospitals. The proposal was approved by the academic committee meeting and subsequently faculty meeting and was sent to the highest authority of the university of Dhaka for approval. On 25 August 2010, the Academic Council of the University of Dhaka approved a 5-year B. Pharm. program from the academic session 2010-2011 instead of the Pharm. D. program. The Academic Council will reconsider this proposal soon and approve the name of the 5-year B. Pharm. program to Pharm. D. as per the international standard^[6,7,8].

In the Pakistan a total of 21 universities are registered with Pharmacy Council of Pakistan for imparting Pharmacy courses. In 2004 Higher Education Commission of Pakistan and the Pharmacy Council of Pakistan revised the syllabus and changed the 4-year B.Pharmacy Program to 5-year PharmD. program. All 21 universities have started the 5-year PharmD Program^[9]. In the Philippines, only the Centro Escolar University offers the degree Doctor of Pharmacy (PharmD). It is a 2-year post baccalaureate degree open to licensed pharmacists in the Philippines.

In Thailand Doctor of Pharmacy (Pharmaceutical Care) program first curriculum in Asia was established at Faculty of Pharmaceutical Sciences, Naresuan University in 1992.

In Europe

In Czech Republic and Slovakia, the Pharm. D. (Pharmaciae doctor) diploma can be obtained by pharmacists who have previously graduated in pharmacy (Magister, Mgr.) (the undergraduate study of pharmacy takes 5 years). The Pharm Dr. title is highly prestigious and written in front of the name.

In France, pharmacy studies can only be accessed through a competitive examination ("concours", with *numerus clausus*) happening at the end of the first year of health studies. Most candidates hold a Scientific Baccalaureate from the equivalent to high schools (lycée). In case of failure, it is possible to retry once.

In Hungary, pharmacists obtain their Master's degree, after 5 years of study. At the end of this period, the student must pass a nationwide exam to be legally entitled for practicing the profession of pharmacy, after acquiring the pharmacist work license. According to the new law in 2008, all pharmacists, who have acquired the Masters degree of Pharmacy, are entitled to the Doctor of Pharmacy.

The education of pharmacists in the Netherlands requires a minimum of six years of university study. EU-harmonisation has led to division into three bachelor and three master years.

A bachelor title is, however, not used at all professionally. The Dutch consider the educational level of their current (M.Sc.)

Degree in Pharmacy to be comparable to the PharmD title in use in the United States.

In Portugal, the student takes the Master's degree in Pharmaceutical Sciences (equivalent to the PharmD program) in one of the 9 Pharmacy faculties with their own respective numerous clauses which comprises a 6 year rigorous study (5 with the uniformities in EU teaching). Finished the degree, the academic title of Doctor of Pharmacy is issued.

In Spain, Pharmacy studies can be accessed after completing five and a half years of University College (with at least 6 months of initiation to Pharmacy Practice). The *Licenciado en Farmacia* or *Grado en Farmacia* (equivalent to the PharmD program) Spanish degree is the only title that allows practicing the profession of Pharmacy in Spain.

Middle East

In 1930 Tehran University, Iran changed the Pharmacy degree from Masters to doctorate and the duration of the study was increased to 5 years^[10,11].

In Jordan, this program was first offered in hajj. This program is not to be confused with Pharmacy Program. When the program was first offered, students shared their first 3 years with medicine student, the last two with pharmacy students and one year of clinical work. After 2006, the program's nature had changed; a new curricula was developed. Students now complete 5 years of academical work and 1 year of clinical practice to earn their Doctor of Pharmacy (B.Sc.) degree.

In Lebanon, the first Doctor of Pharmacy degree was awarded by the Lebanese University Faculty of Pharmacy (upon a decree by the Lebanese government) in 1992. The 6-year entry level PharmD program at the Lebanese University adopted the US PharmD curriculum and training.

In Qatar, pharmacy degrees are offered by the new College of Pharmacy at the Qatar University. Students were accepted into the 5-year BSc (Pharm) program commencing in 2007. Students will be accepted into the final year of the 6-year PharmD program in 2011.

The PharmD programs was started in 2001 at King Abdulaziz University, then in 2005 at Ibn-Sina University, then 2006 at KFU, then 2007 at Qassim University. In 2008, KSU College of Pharmacy at Riyadh, College of Pharmacy at Kharj, and Taif University started their PharmD programs. The degree duration in Saudi Arabia is six years in total, including one academic year of clinical rotations.

The PharmD programs were started in 2008 at Gulf Medical University, Ajman, United Arab Emirates. The first university in UAE to offer Pharm D and approved by the Ministry of Higher Education. This



course is an advanced practice degree specialized in advanced clinical practice. Pharm D is five and half year program for high school graduates and three year (Post Bacallaureate) program for B.Pharm graduates.

In North America

In Canada, the PharmD program is offered in both English and French. As of fall 2007, the PharmD program is offered at the Université de Montréal (in French) and, as of fall 2011, at the Université Laval (in French). The Université de Montréal was the first Canadian university to give this program instead of the bacallaureate program in pharmacy. A PharmD degree may also be obtained upon completion of a post-graduate program through the University of British Columbia and the University of Toronto.

In the United States, the PharmD (Doctor of Pharmacy) degree is a professional degree that prepares the graduate for pharmacy practice. It is awarded after completing at least 2-3 years of undergraduate prerequisites and then four (or three continuous) years of pharmacy school, which include at least one year of practical experience. Most schools require students to take an entrance test (PCAT) and complete 60-90 credit hours (2–3 years) of university coursework in the sciences, mathematics, composition and humanities before entry into a professional program. Many pharmacy students complete a bachelor's degree before entry to pharmacy school. Total time: 4 years undergraduate (Bachelor degree), 4 years professional degree (PharmD), optional 1–3 years of specialization (residency/fellowship).

Scope, Utility and Practice

Out of the services patient medication counseling is considered to be the most important part from a patient's point of view. The information that may be discussed while a counseling session purpose, expected action, storage, method of administration of drugs and medical devices. Overall skills required to provide better clinical pharmacy services are up-to-date knowledge of clinical aspects of drugs and good communication skills^[12,13].

Table-04: Role of (Pharm D) candidates in hospitals

Activity	Role
Medication history interview	To ask the patient about his medication history to optimize the further therapy
Participation in ward rounds and meetings-	To enable prescribing to be influenced at the time of decision making To contribute to patient care through the provision of drug information and promotion of rational drug therapy
Provision of drug/poison information-	To provide accurate and relevant information on drug related matters (generally clinical aspects of drugs, e.g., use, administration) verbally or in written to persons involved in prescribing, administration, monitoring and use of medicines To prepare specific drug related resources such as protocols and patient information leaflets To provide poison information to physicians
Prevention, assessment and management of drug interactions	To review the medication order for the adverse drug interactions To identify patients at risk of adverse drug interaction To suggest suitable method of management for the interaction To take appropriate steps to avoid recurrence of interaction with adverse sequelae To ensure early recognition of drug interactions to prevent adverse sequelae
Adverse drug reaction management (ADR)	To detect, assess and correlate, manage, document and to prevent ADRs To encourage nursing and medical staff as well as patients, to report ADRs
Medication order review	To ensure the patient receives most appropriate drug, dose, dosage form To minimize drug related problems
Clinical review	To determine the priorities of the treatment with reference to therapeutic outcomes desired by the patient To evaluate and monitor patient's therapy To review the outcomes of the treatment
Therapeutic drug monitoring (TDM)	To optimize therapy for the drugs for which there is known relationship between therapeutic effect and measured concentrations To identify the desired therapeutic outcomes
Selection of drug therapy	To ensure the drug selection follows local guidelines, formulary and availability limitations where applicable To promote quality use of medicines To optimize the clinical outcomes and quality of patient care
Patient medication counseling	To provide the information directed at encouraging safe and appropriate use of medication for the enhancement of better therapeutic outcomes To monitor new dosage and medications
Liaison with community services	Ex. - To communicate concerning special problems, e.g., provision of medication aids Ex. - To encourage the patient to contact to their hospital pharmacist

Table-05: Difference between M. Pharm (Pharmacy Practice) and Pharm D (Post Bacallaureate)

	M. Pharm (pharmacy practice)	Pharm D (post bacallaureate)
Regulatory body	All India Council for Technical Education (AICTE) and Pharmacy Council of India (PCI)	Pharmacy Council of India (PCI)
Duration of course (after B. Pharm)	2 years	3 years
Project/thesis work	1 year (during 2 nd year)	Six months (during 2 nd year)
Internship	No	Yes (for 1 year)
Prefix 'Dr.' (Doctor) after course	No	Yes



After completion and during the course Pharm.D candidates may provide the clinical pharmacy services in the hospital in the areas Clinical Research Organization (CRO), Pharmacovigilance, Pharmaco-economics, Community Services, Research and Academics. Pharm. D candidates need to work hard and get recognized in the society for patient care by clinical pharmacy services. They have to create a support with other healthcare providers such as physicians, nurses, and also with patients. Pharm D candidates have to generate the need of clinical pharmacy services in the society and prove its importance^[14, 15].

As the Pharm D is mostly patient-centered curriculum, therefore, patients will be benefited the most. The patients would be able to know all the information about their disease, drugs and lifestyle modifications for the disease in future which would definitely increase prognosis of the patients. The clinical pharmacy services would also minimize the work-load of physicians from their busy schedule as well as it would decrease the load on the Indian health-care system^[16].

As a summary, it can be expected that the Pharmacists, i.e., Pharm D would play a major role in Indian health care system in future. This course will give an opportunity to pharmacists to work more prominently in Indian health care system^[17].

Conclusion

According to the International Pharmaceutical Federation (FIP), there must be well-planned execution of good pharmacy practice in developing countries. Thus, the implementation of the Pharm.D program must largely emphasize pharmaceutical care encompassing areas of patient care such as hospital and clinical pharmacy. It should not be used as a tool for the pharmacist to be employed internationally or as a sole instrument of professional power and status. If it is so, then implementation of the Pharm. D degree is certainly questionable and merits justification^[18].

The profession of pharmacy in India is not just the "change from D. Pharm to Pharm.D" but change in quality pharmaceutical education to meet the challenges and the needs of the nation in the 21st century^[19].

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests