

Doctor of pharmacy: Boon for health-care system

Lavanya Voora¹, Sujit Kumar Sah², Ramesh Bhandari³, C. S. Shastry⁴, Sharad Chand^{4*}, Kala Bahadur Rawal¹, U. P. Nandakumar⁴, B. C. Vinay⁴

ABSTRACT

Pharm D is a new professional academic course that started in the year 2008 in India. It has a broad spectrum compared to those of other conventional professional pharmacy courses. The unique feature of prefixing (Dr.) and provision of joining Ph. D after Pharm D allure the students all over the country. The syllabus is designed to cater to the clinical needs and fill the gap between patients and doctors. Graduated students have plenty of opportunities both in India and abroad in the field of health-care services. Despite having a well-designed syllabus, Pharm D is still facing several problems at the practice level for its recognition. Although it has been a decade and more, the program is still in its budding stage. Pharm D students are striving continuously for appropriate attention and recognition by regulatory authorities as well as by the community.

KEY WORDS: Clinical pharmacy, Clinical pharmacists, Doctor of pharmacy, Pharm D

INTRODUCTION

Doctor of Pharmacy is comparatively a new academic, professional postgraduation course in the perspective of India. The course got its due recognition from regulatory authorities in the year 2008 AD. Pharm D is the widely used short form for the Doctor of Pharmacy.^[1,2] In India, the duration of the Pharm D program after the intermediate course (10+2) is of 6 years (5 academic years and 1 year of internship). Similarly, Pharm D (postbaccalaureate) is a 3-year postgraduation course, which is designed as the first 2 years of academic classes with 1 year of compulsory internship.^[2-4] The eligibility criterion for postbaccalaureate is a Bachelor of Pharmacy (4-year graduation course in pharmacy).^[5]

REGULATIONS OF PHARM D IN INDIA

The Ministry of Health and Family Welfare (MOHFW) and Pharmacy Council of India (PCI) approved the course on May 10, 2008, and formed the regulations framed under section 10 of the Pharmacy Act, 1948.

Subsequently, it got approved by other regulatory bodies like the Government of India, Ministry of Health. PCI made the following regulations after approval from Central Government:^[1-3]

Chapter I

1. Short title and commencement – These regulations may be called the Pharm D Regulations 2008
2. Pharm D graduates shall obtain a certificate, stating that they passed the course of study and examination as prescribed in the regulation, for registration as a pharmacist, and to practice the profession under the Pharmacy Act, 1948.

Chapter II

The minimum duration of the course shall be of 6 academic years (5 years of study and 1 year of internship or residency), the full time each academic year spread over not <200 working days. The period of 6 years duration is divided into two phases:

- Phase I: Consisting of the 1st, 2nd, 3rd, 4th, and 5th academic years.
- Phase II: Consisting of internship or residency training during the 6th year, involving postings in specialty units.

The student shall be exposed to clinical pharmacy services during the internship or residency phase.

Access this article online

Website: jprsolutions.info

ISSN: 0975-7619

¹Department of Pharmacy Practice, TVM College of Pharmacy, Ballari, Karnataka, India, ²Department of Pharmacy Practice, JSS College of Pharmacy, JSSAHER, Mysuru, Karnataka, India, ³Department of Pharmacy Practice, KLE College of Pharmacy (Constituent Unit of KAHER), Belagavi, Karnataka, India, ⁴Department of Pharmacy Practice, NGSM Institute of Pharmaceutical Sciences, (NITTE-Deemed to be University), Paneer, Deralakatte, Mangaluru, Karnataka, India

*Corresponding author: Dr. Sharad Chand, Department of Pharmacy Practice, NGSM Institute of Pharmaceutical Sciences, (NITTE-Deemed to be University), Paneer, Deralakatte, Mangaluru - 575 018, Karnataka, India. E-mail: sureechand193@gmail.com

Received on: 16-07-2019; Revised on: 14-08-2019; Accepted on: 19-09-2019

He/she shall acquire skills under the supervision of a capable physician and clinical pharmacist. The student should gain thorough knowledge and practice and should become capable of carrying out clinical pharmacy activities independently.

Pharm D (postbaccalaureate): This course should consist of the following two phases:

- Phase I: Consisting of the 1st and 2nd academic years
- Phase II: Consisting of internship or residency training as applicable in Pharm D.

SPECTRUM OF DOCTOR OF PHARMACY

Pharm D is a noble course having integration of both bachelor and master programs as a single academic course. It is having unique features of eligibility to prefix “Dr.” to their name and can register for Doctor of Philosophy (Ph. D) program.^[2,3] During the course, students are exposed to various clinical services in hospitals. Students with sufficient clinical knowledge should provide all the clinical pharmacy services in the hospitals and other working areas such as clinical research centers, pharmacovigilance programs and centers, pharmacoconomics research, outreach clinics, screening programs, pharmacoepidemiological research, academics, and at the community level. The most considerable activity of clinical pharmacists is patient counseling, which has a key importance, from a patient’s point of view.^[6-9] Clinical pharmacist educates the patients regarding the purpose of therapy, expected outcomes, storage condition of medications and medical devices, disease condition, method and route of administration, possible side effects and adverse effects of drugs, and ways to minimize them.^[10] Apart from being a conventional pharmacist, clinical pharmacists can also contribute as medical writers, clinical data managers, clinical trial managers, clinical research coordinators, liaison officers, drug safety officers, and many more.^[11]

Conventionally, pharmacy graduates in India have been trained with skills focusing on the formulation, compounding and dispensing, marketing, academics, and other pharmaceutical industrial aspects. The introduction of the Pharm D course in India has widened all the scopes of pharmacists toward patient care.^[12] The inclusion of subjects such as pharmacotherapeutics, clinical pharmacy practice, and therapeutic drug monitoring has provided insights into shedding light on understanding the patient’s health-care benefits.^[10,11] Additional subjects such as pharmacogenomics, therapeutic drug monitoring, clinical toxicology, and pathophysiology give the pharmacists away to understand the molecular mechanism of disease manifestations and ways to manage them. The inclusion of subjects such as

biostatistics and research methodology, clinical research, and pharmacoconomics offers a better understanding of recent trends and trains in research areas.^[13] The unique feature of 6 months of clerkship activities and 12 months of internship activities in various departments sufficiently exposes the students clinically, to take clinical decisions independently.^[2] The diverse knowledge and clinical knowledge in several areas of pharmaceutical science and clinical practice hold the Pharm D in the expert designation to offer their services that contribute to better patient care.^[5,7]

NEED FOR DOCTOR OF PHARMACY PROGRAM IN INDIA

The primary motive behind the starting of Pharm D course in India is to educate and train the students to meet the shortage of pharmacists in Indian hospitals, to produce the clinical pharmacists for the sole reason to promote the health-care services, and also to matchup the credit hours as postgraduation level Pharm D curriculum as implemented in the United States of America. Several institutions have submitted the proposal in the initial round, and PCI selected 20 pharmaceutical science institutions in India. PCI forwarded a suitable proposal to the Indian MOHFW for further review and approval. Similarly, the National Association of Boards of Pharmacy (NABP) in the United States has amended the rules and formed a new requirement for entry and registering under the Foreign Pharmacy Graduate Equivalent Examination (FPGEE).^[14,15] NABP states to have a minimum of 5 years of study to register as FPGEE and further processing for the North American Pharmacist Licensure Examination (NAPLEX). After passing the NAPLEX examination, the individuals will be conferred with a license to practice as a registered pharmacist in North American territory. This was another reason for the modification in the pharmacy course in India.^[15,16] Several philosophers and pharmacists took it as a positive step in the field of pharmacy and to prepare pharmacists as qualified and skilled health professionals. The vast knowledge of pharmaceutical sciences and skills in clinical set up has given a thought to optimize patient’s drug therapy and enhance patient safety. The paradigm shift from the conventional pharmacist in industry, community, and as a compounder and dispenser in hospital pharmacy, the profession of pharmacy has entered the era of multidisciplinary collaborations of health professionals to assure patient safety.^[17,18] Furthermore, to develop the hospital as the safe place for patients, the accreditation of hospital by several agencies such as the National Accreditation Board for Hospitals and Healthcare Providers, National Accreditation Board

for Testing and Calibration Laboratories, and Joint Commission International is of critical importance nowadays. Such accrediting bodies well accept the importance of a clinical pharmacist's role.

CLINICAL PHARMACY ACTIVITIES IN HOSPITALS BY PHARM D

The pharmacy has been the profession to look at the pharmaceutical aspect of the industrial and community setup. The pharmacy has now expanded its areas around direct healthcare, all across the globe as well as in India. Still, there are numerous challenges at ground level that should be timely addressed, to raise the standards of health in the nation. The course of pharmacy needs continuous updating and suitable modification depending on the health demand of a particular geographical area.^[19] This need for modification justifies the introduction of a doctor of pharmacy course in India. Thus, the commencement of the Pharm D program in the nation was a necessary decision, which got due recognition and was welcomed by pharmacy professionals. Over 600 pharmacy colleges are offering the Pharm D course across India. The activities and interventions by clinical pharmacists are proven to have a positive impact on patient care.^[20] This evidence is supported by several scientific studies conducted in India and abroad. The department of pharmacy practice is the department primarily dealing with the Pharm D education. It aims to promote rational drug use and provide several clinical pharmacy services in the hospital. Some of the major clinical pharmacist activities carried out by Pharm D students and professionals in the hospital to support sound patient care are as follows:

Participation in Ward Rounds

A clinical pharmacist needs to attend the patient's ward rounds daily, along with the multidisciplinary team of a physician. Every clinical pharmacist actively discusses the clinical condition of a patient with other health professionals, including doctors. Clinical pharmacist learns all the cases and provides complete drug information to the ward round team and analyzes the prescription for possible side effects and adverse drug reactions (ADRs). Any suspected or identified ADRs could be reported in the Pharmacovigilance Program of India. Comprehensive knowledge of clinical pharmacist helps during the decision-making of therapy.^[3,10]

Medication History Review

The pharmacist interviews the patient about demographic details, obtains the complete history of patients including the previous status of the disease, medication used for known disease, allergic history

with drug, and other allergens, and personal history of patients including birth history, immunization history, and menstrual history, wherever applicable. Information regarding diet, elaboration of present illness, and verifying the presented complaints with documents are some of the basic activities done by Pharm D students and clinical pharmacists. Medication history is made to obtain the complete drug usage pattern overtime by a patient; this may assist in endorsing the most suitable therapy.^[5,10]

Pharmaceutical Care

Clinical pharmacists will collect the data and collate the collected data in a suitable format (SOAP format). The relevant information collected from the patient gives a brief insight into the diseased condition, which helps in setting the desired goals and clinical endpoints. Monitoring the efficacy of therapy and assessing the drug-related problems, including various ADRs, help in better patient care. Clinical pharmacist follows the patient and monitors for therapeutic and toxicity parameters, counsels the patients, and maintains all the documents.^[10,13]

Prescription Order Review

Clinical pharmacists review the individual patient's prescription. While reviewing patient prescription orders, pharmacists focus on rational therapy, medication duplication, interactions, incompatibility, and ADRs, along with this cost-effectiveness for drugs, the patient medication order is matching with the dispensed medications. After a thorough review, if the pharmacist finds any errors, it can be discussed with the physicians in the next day ward rounds participation.^[3,10]

Pharmacovigilance Activities

In every region, a pharmacovigilance center is necessary.^[7] The pharmacist plays a key role in the pharmacovigilance center. Clinical pharmacy activity majorly focuses on identifying, assessing, and monitoring of ADRs in the hospital. During ward rounds, they monitor the patients, who are susceptible to ADRs due to the previous history of reactions to the drug or through routine drug therapy monitoring.^[17,18] After identifying the ADR, the pharmacist assesses the severity of ADR using Naranjo scale algorithm, modified Hat wag, Siegel Scale, Modified Schumock, and Thornton Scale, respectively. They will provide an alert card based on the patient's condition. The pharmacist will share information regarding ADR to the physicians, and they report to the pharmacovigilance center, and later, they will document to prevent the reoccurrence of such incidence.^[20,21]

A pharmacist lead clinical pharmacy services are milestones in the context of Indian pharmacy education. Several clinical and research activities

carried out by clinical pharmacists, and Pharm D students in hospitals are defining the need for clinical pharmacists in hospitals. It is already proven and accepted that pharmacist plays a crucial role in the decision-making of prescription. This is raising the standard of pharmacy education in India.^[22]

Prevention, Assessment, and Management of Drug Interactions by the Pharmacist

Mainly the patients who are having multiple disease state, multiple drug therapy, and geriatrics, pediatrics patient's pharmacist should check for the major drug-drug interactions which lead worsening condition in a patient.^[23] If any interactions may lead to an adverse effect on the patient, it has to be reported to the respective physician. Interactions can be identified using software such as Micromedex, Lexicomp, UpToDate, textbooks, and other sources. If any interactions have been found, then pharmacists should explain the interaction causing drugs, types of interaction, and the severity of interaction along with the best alternative therapy. The interaction should be documented meticulously to prevent future recurrence and should be brought in the notice of the pharmacy and therapeutic committee for safe policymaking. Hence, the interactions can be minimized in the coming days.^[24,25]

Patient Counseling Services

Patient counseling is one of the most essential and critical activities of the clinical pharmacist in tertiary care teaching hospitals, the clinical pharmacist and Pharm D student counsel the patient regarding the existing disease and their medication. In every hospital, there should be the counseling center to provide patient counseling to the inpatients and outpatients. Pharmacists should counsel the patient regarding their disease state, medication counseling, device counseling if they are using, dosage form, route of administration, duration of the medication, and a dose of the medication. The patients should also be counseled regarding lifestyle modification, and the strict diet that has to be followed, that aids the patient to improve the quality of life and also enhance better patient care.^[26,27]

Drug Information Services

In every tertiary care teaching hospital, pharmacist manages a drug information center (DIC) under the department of pharmacy practice. A pharmacist provides all the relevant information regarding all the queries raised by health-care professionals and patients. The information may cover broad categories of diseases, drugs, and lifestyle to be followed or of any form. In short, the drug information center provides information regarding entire aspects of drugs, pharmaceutical devices, diseases, and toxic

substances.^[28] The center may receive the queries through specifically designed drug information request form or through direct telephone calls to the DIC, manually visiting DIC, and by any other electronic means such as the internet, fax, request portal, or by e-mail.^[7,29] There are various drug information sources required to answer the queries received. Various sources maintained in DIC are scientifically published or peer-reviewed journals, bulletin of organizations, various institutional and organizational newsletters, magazines, gazettes, etc., secondary sources include summary of primary sources, and other electronic databases such as UpToDate, Clinirex, Micromedex, Lexicomp, therapeutic guidelines eGT, institutional guidelines, and hospital formularies; similarly, the tertiary sources include textbooks, monographs, AHFS, BNF. The pharmacist should provide the information to the requester after referring to the standard source.^[30]

CURRENT STATUS OF PHARM IN INDIA

In the present day, large and tertiary care hospitals in the private sector employ clinical pharmacists: According to Nobil Skaria, general secretary, Doctor of Pharmacy (Pharm D) postgraduates, they have no employment opportunities in the government sector.^[31-33] However, there is an urgent need for clinical pharmacists in the government sector as doctors are left to manage a large number of patients. Around 500 clinical pharmacists work in the private sector.^[34] The government should give serious thought to the matter as it will go a long way in bringing down medication errors. Pharm D graduates study the whole canvas of a drug from the effect it makes in the body, its adverse reactions, how a particular drug dosage could harm rather than cure, or why a drug is less effective if taken with certain food items and so on.^[35] This issue can be addressed by prescription auditing, ADR monitoring, and optimum use of medicines, thereby bringing down expenses by introducing them in medical colleges and hospitals.^[36]

PHARM D IN OTHER NEIGHBORING COUNTRIES

Nepal

In Nepal, in the year 2010 AD, Kathmandu University started 3 years postbaccalaureate Pharm D course. The course was undertaken by the department of pharmacy practice on a campus situated in Dhulikhel, Kavre. The course was having 1 year of the mandatory internship program as in India. There was no Pharm D course of 5 or 6 years as in Pakistan and India.^[37] Due to the regulatory issue by the Nepal Pharmacy Council, the same course was scrapped and further enrollment

was halted.^[38] The postbaccalaureate Pharm D is being registered as postgraduate pharmacist after clearing licensing examinations, whereas the regular Pharm D student studied for 5 years from Pakistan and 6 years from India which are not being registered as a postgraduate. Even though postgraduation recognition in India, the same course is being registered as an undergraduate equivalent to a Bachelor of Pharmacy.

Pakistan

The existing 4 years Bachelor of Pharmacy program was upgraded to 5 years Doctor of Pharmacy (Pharm D) program in the year 2004 by the Pakistan Council of Pharmacy.^[39] As in India, the enrollment was done after 12 years of schooling education in any stream of science.^[40] The primary focus of this 5-year professional program was to incorporate the role of pharmacists in patient care. The Pharm D program is of 5-year duration in Pakistan, which is different from 6-year Pharm D course in India.^[41] The clerkship and internship program is the same in both and Pakistan, but the study duration varies in both nations. Despite differences in course structure and academic year, both nations share the common goal of optimized patient care and ensuring patient safety.^[42]

Bangladesh

Four years of a Bachelor of Pharmacy program and 1 year of postgraduation program approved by the Pharmacy Council of Bangladesh started a similar course of Pharm D of 5 years. As in India, the eligibility for enrolling in Pharm D was an intermediate course in any stream of science. The clerkship and internship programs are the same as in countries such as India, Pakistan, and Thailand.^[43,44]

Thailand

Thailand was the first Asian country to introduce the Pharm D program. The course structure was of 6-year program having the same structure presently existing in India. The course was introduced long back in the year 1992 AD at Naresuan University with the objective of better patient care. Pharm D was more suitable in the aspect of pharmaceutical care and the field of industrial pharmacy.^[31,32]

CONCLUSION

Doctor of Pharmacy is the latest course in the context of India. Although it has been more than a decade, yet it is in the budding stage. Pharm D students are striving continuously for appropriate attention and recognition by regulatory authorities as well as by community peoples. The Pharm D course is designed to gratify the need for patient care by providing clinical pharmacy services in hospitals and health-care institutions. Pharm D is a promising course in terms of curricula, and clinical skills, the timely mobilization

of services provided by a clinical pharmacist may strengthen the multidisciplinary and holistic approach in patient care. Pharm D students have to prove their importance and create an opportunity for them by showing their expertise. As it is an extensively patient-oriented curriculum, the direct and indirect benefit to the patients should be demonstrable. The clinical pharmacy services would significantly minimize the workload of health professionals and may contribute to strengthening the Indian health-care system. Hence, it can be concluded that the course is well designed for addressing the clinical issues; Pharm D students should train themselves adequately to contribute to the Indian health-care system from an individual level.

REFERENCES

1. Pharm D. Regulations The Gazette of India, Part III, Section 4. Ministry of Health and Family Welfare. Pharmacy Council of India; 2008. p. 1-97. Available from: <http://www.pci.nic.in/PDF-Files/PharmD-Revised-A.pdf>. [Last accessed on 19 Mar 20].
2. Pharm D. Regulations 2008, Regulations Framed Under Section 10 of the Pharmacy Act, 1948 (8 of 1948). Available from: <http://www.pci.nic.in/PDF-Files/PharmD-Revised-A.pdf>. [Last accessed on Mar 2019].
3. Pharmacy Council of India. Available from: <http://www.pci.nic.in>. [Last accessed on 19 Mar 20].
4. Deshpande PR, Farooq KK, John DM, Rao EJ. Pharm D a new concept in India. *J Pharm Bioall Sci* 2012;4:84-6.
5. Frequently Asked Questions about Pharm D. Available from: <http://www.pci.nic.in/PDF-Files/question.PDF>. [Last accessed on 19 Apr 20].
6. Sharma H, Jindal D, Aqil M, Alam M S, Karim S, Kapur P. A survey for assessment of the role of the pharmacist in community pharmacy services. *J Pharm Bioall Sci* 2009; 1:23-6.
7. Dooley MJ, Galbraith K, Burges N, McLennan DN. Multicentre pilot study of a standard approach to document clinical pharmacy activity. *Aust J Hosp Pharm* 2000;30:150-6.
8. Pharmacovigilance Program of India (PvPI). Available from: http://www.cdsc.nic.in/pharmacovigilance_intro.htm. [Last accessed on 2019 Apr 05].
9. Chauhan N, Moin S, Pandey A, Mittal A, Bajaj U. Indian aspects of drug information resources and impact of drug information centre on community. *J Adv Pharm Technol Res* 2013;4:84-93.
10. Dooley M, Bogovic A, Carroll A, Cuell S, Galbraith K, Matthews H. SHPA standards of practice for clinical pharmacy. *J Pharm Pract Res* 2005;35:122-46.
11. Prasanna RD, Ahsan FK, Sudeepthi BL, Kazim S, Sonal SM, Manohar B, et al. Assessment of medicine information provided on demand by clinical pharmacists in nephrology wards in a tertiary care hospital. *Indian J Pharm Pract* 2013;6:25-9.
12. Palaian S, Prabhu M, Shankar PR. Patient counseling by pharmacist-a focus on chronic illness. *Pak J Pharm Sci* 2006;19:65-72.
13. Viswanad V, Prabhakar V. The emergence of the clinical pharmacist and the Indian scenario. *Inventi Impact* 2011;1:4-7.
14. Ghilzai NK. New FPGEE guideline. *Am J Pharm Educ* 2006;70:46.
15. Ghilzai NK. In response to the letter entitled pharmacy graduates from foreign countries flooding US job market. *Am J Pharm Educ* 2004;68:23.
16. Dutta A. In response to the letter entitled pharmacy graduates from Foreign countries flooding US job market. *Am J Pharm Educ* 2004;68:23.
17. Dutta A. The FPGEE curriculum requirement: An insurmountable hurdle? *Am J Pharm Educ* 2005;69:105.

18. Dikshit RK. Challenges in pharmacovigilance. *Indian J Pharmacol* 2010;42:333.
19. Chopra D, Wardhan N, Rehan HS. Knowledge, attitude and practices associated with adverse drug reaction reporting amongst doctors in a teaching hospital. *Int J Risk Saf Med* 2011;23:227-32.
20. Bhatt PA. Being a clinical pharmacist: Expectations and outcomes. *Indian J Pharmacol* 2014;46:1-2.
21. Singh H. Pharmaceutical education and pharmacy practice: A historical perspective. *Pharm Times* 2009;41:16-8.
22. Jesson J, Bissell P. Public health and pharmacy: A critical review. *Crit Public Health* 2006;16:159-69.
23. Lal LS, Rao PG. Clinical pharmacy education in India. *Am J Health Syst Pharm* 2006;62:1510-1.
24. Jain S, Basu S, Parmar VR. Medication errors in neonates admitted in intensive care unit and emergency department. *Indian J Med Sci* 2009;63:145-51.
25. Kumar AY, Kumar RV, Ahmad A, Mohanta GP, Manna PK. Pharmacists interventions and pharmaceutical care in an Indian teaching hospital: A prospective study. *Int J Adv Res Pharm Biol* 2012;1:386-96.
26. Gupta SK, Nayak RP. An insight into the emerging role of regional medical advisor in the pharmaceutical industry. *Perspect Clin Res* 2013;4:186-90.
27. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. *Am J Hosp Pharm* 1990;47:533-43.
28. George B, Rao PG. Assessment and evaluation of drug information services provided in a South Indian teaching hospital. *Indian J Pharmacol* 2005;37:315-9.
29. Mangasuli S, Rajan S, Khan SA. A decade of pharmacy practice education in India. *Am J Pharm Educ* 2008;72:16.
30. Joyce AW, Sunderland VB, Burrows S, McManus A, Howat P, Maycock B. Community pharmacy's role in promoting healthy behaviours. *J Pharm Pract Res* 2007;37:42-4.
31. Khan TM. Critical considerations in pharmacy curriculum development in South Asian and Southeast Asian developing nations. *Am J Pharm Educ* 2010;74:176g.
32. Khan T, Anwar M, Mueen Ahmed K. A perspective for clinical pharmacy curriculum development and validation in Asian developing nations. *J Young Pharm* 2011;3:151-4.
33. Yang E, Shin TJ, Kim S, Go Y, Lee S. The pedagogical validity for a six years curriculum in pharmacy education. *Korean J Med Educ* 2005;17:225-38.
34. Parthasarathi G, Ramesh M, Nyfort-Hansen K, Nagavi BG. Clinical pharmacy in a South Indian teaching hospital. *Ann Pharmacother* 2002;36:927-32.
35. Srikanth BA, Ahmad A, Reddy RK, Balkrishnan R, Nagappa AN. Acceptance of doctor of pharmacy in India: A survey based study. *Arch Pharm Pract* 2013;4:93-7.
36. Basak SC, Sathyanarayana D. Pharmacy education in India. *Am J Pharm Educ* 2010;74:68.
37. Bhuvan KC, Subish P, Mohamed Izham MI. Pharm D education in Nepal: The challenges ahead. *Am J Pharm Educ* 2011;75:38c.
38. Bhandari DR, Subish P, Mishra P, Alam K. Do pharmacists have a scope in South Asian hospitals? An experience from Nepal. *Pharmacologyonline* 2006;3:146-55.
39. Babar ZU. Pharmacy education and practice in Pakistan. *Am J Pharm Educ* 2005;69:105.
40. Bhagavathula AS, Sarkar BR, Patel I. Clinical pharmacy practice in developing countries: Focus on India and Pakistan. *Arch Pharm Pract* 2014;5:91-4.
41. Azhar S, Hassali MA, Ibrahim MI, Ahmad M, Masood I, Shafie AA. The role of pharmacists in developing countries: The current scenario in Pakistan. *Hum Resour Health* 2009;7:54.
42. Pichala PT, Kumar BM, Zachariah S, Thomas D, Saunchez L, Gerardo AU. An interventional study on intensive care unit drug therapy assessment in a rural district hospital in India. *J Basic Clin Pharm* 2013;4:64-7.
43. Mazid MA, Rashid MA. Pharmacy education career opportunities for pharmacists in Bangladesh. *Bangladesh Pharm J* 2011;14:1-9.
44. Alam GM, Shahjamal MM, Al-Ameen AQ, Azam MN. State of pharmacy education in Bangladesh. *Trop J Pharm Res* 2013;12:1107-12.

Source of support: Nil; Conflicts of interest: None Declared