Review Article

# Status of Drug Information Centre and Services in India: An Overview and Challenges

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**Received:** 21-06-2020; **Revised:** 18-09-2020; **Accepted:** 26-09-2020; **Published on:** 20-10-2020.

**ABSTRACT**

Clinical pharmacists provide their round the clock contribution towards medication-related information to physicians, while physicians face challenges in their routine practice due to several reasons such as overloaded number of drug approvals, increased number of scientific research data in medical literature published day to day, making it more complicated for physicians to stay updated with the current advancements. The drug information center (DIC) is the connecting bridge among healthcare team members by providing proper, unbiased, updated drug information for better patient care. Novel initiatives, such as safe use of antibiotic programs, rational drug therapy, therapeutic drug monitoring and pharmacovigilance are also being considered in parallel. Similarly, DIC activities have a huge potential to fit in as an integral part of curriculum for medical and pharmacy courses. Developing countries have been running variety of programs on drug information like residencies, internships, fellowships for the training of pharmacy and medical students. This is the need of the hour for a country like India to involve such practices in our course curriculum as well as in medical practices for promoting rational use of drugs. This review highlighted to know about the current status of drug information services and future requirements to develop the clinical practice with the services rendered through it.

**Keywords:** Drug information, Clinical pharmacy, Drug information centre, Drug information services.

**QUICK RESPONSE CODE →**

**DOI:** 10.47583/ijpsrr.2020.v64i02.010

**DOI link:** http://dx.doi.org/10.47583/ijpsrr.2020.v64i02.010

## INTRODUCTION

Providing drug information is one of the clinical pharmacy services which strengthen the core concept of pharmacy practice in the hospital as well as community settings. Concept of clinical pharmacy service was first introduced in the twentieth century by Prof. Youngken Jr. and L.W. Rising at University of California. In India, although clinical pharmacy is yet in infancy, challenges are there for the development and provision of clinical services to patient and other health care team members in every type of hospitals and pharmacy set up. Clinical pharmacy services provided by clinical pharmacist in the hospital involve drug dispensing, drug distribution, drug information, ward round participation, medication history interview, medication order review, clinical review, pharmacovigilance, academic detailing and sterile & non-sterile manufacturing.[1] In response to rising need for improvement in the efficacy, safety, potency and accuracy of drug therapy, the profession of pharmacy required to evolve out new functions and responsibility for pharmacy professionals to promote rational drug use.[2] The term "Clinical Pharmacy" was originated to describe the working potential of pharmacists whose primary role is to interact with the patients and health care team members, make specific drug therapy recommendations, monitoring response towards drug therapy and providing drug information to requesters. Therefore, clinical pharmacy services are defined as those services provided by pharmacists in an attempt to promote rational drug therapy which are safe, appropriate and cost-effective. Clinical pharmacist's are primarily involved in hospitals and clinical care settings and thereby provide patient-oriented rather than product-oriented services.[3,4]

In an emerging complex health care environment, it is difficult to compare the effectiveness of different treatment.[5] Clinical pharmacists should assume that all patients need pharmaceutical care until they have been assessed to exclude drug therapy problems. Although, due to limited resources, this step is not always possible and a systematic approach may need to be adopted to facilitate the targeting of care.[2] These activities are undertaken specially by well-trained individuals i.e. Pharm. D graduates (Doctor of Pharmacy) and Pharmacologists. In this decade more than 68,000 new formulations were coming into market with subsequent increase in number of adverse drug events. It is very difficult to remember all the side effects and adverse drug reactions of all drugs to the health care professionals to monitor the patients. So,

clinical pharmacist has to play a key role in identification of such adverse drug reactions along with the duty to assess and monitor them to help physicians.[6] Apart from that these professionals have more exposure with the patients, nurses, doctors and in all levels of health care professions so they could report newly detected case reports as well as signals to the world some time a rare and new unknown adverse drug effect. Because of the constant and continuous interactions with the patients, pharmacist is able to give proper patient educations which will lead to increase medication adherence.[7]

Lack of unbiased drug information and lack of time are some of the factors that make the physicians unable to update with current clinical concepts about drugs that resulted to help and improve better patient care.[8,9] The way to decide which drug is best for formulary addition is to rationally evaluate all aspects of scientific information in relation to similar agents.[10,11] In developing drug formulary and also for implementing rational therapy, the influence of drug information centre (DIC) is very much appreciable. The centre focuses on providing proper drug information, well referenced, critically evaluated and updated information which promotes safe and effective use of medication.[12] Due to limited availability of current literatures, authenticated open access databases, under reporting and poor documentation of drug related problems especially adverse events (AEs) and adverse reactions, most of the developing countries suffer from lack of drug information. After developing drug information centers in various parts of India, clinical pharmacists can directly involve in the patient care by making interventions, decreasing the medication errors and improve the patient compliance.[6]

World Health Organization (WHO) recognizes the drug information centre, as a core component of national programs, to promote the rational use of medicines and the primary services provided by such centres include collecting, reviewing, evaluating, indexing and distributing information about medicines among health workers. This allows access to clinical experiences, libraries, research facilities and educational activities.[13]

India is country with significant drug related problems. Irrational and unnecessary prescribing is common and antibiotic resistance is widespread. These problems arise out as a result of variety of economic, social, political, occupational, medical and regulatory factors. The most important of these includes:

- The lack of awareness about the drug information centre.
- The availability of 80,000 plus formulations.
- The lack of awareness of principles of rational drug use of drugs amongst doctors and pharmacists.
- The widespread sale of prescription drug over the counter.
- A high level illiteracy, poverty among patients.[14]

The term 'drug information' developed in the early sixties. The first drug information centre was opened at the University of Kentucky Medical Centre in 1962, where an area separated from the pharmacy was dedicated in providing drug information service.[15]

**Need for Drug Information:**

In the past, the limited need for drug information was due to the smaller range of available drugs but now, newer drugs and multiple combinations of the treatment being introduced. There are more than 20,000 biomedical journals available and more than 6,000 journal published every day. It is very difficult task for health care professional to keep themselves up-to-date with available drug information. Most of the developing countries like India suffer from lack of adequate drug information due to various factors like limited accessibility of current literature, poor documentation, poor funding etc. The lack of accurate drug information service in India poses problem and doctors in general get their information from medical representative who obviously are partially biased towards their product. In India, low income levels populations, the multiple health care systems and lack of information about the risks and benefits of drug therapy make good clinical pharmacy practice all the more relevant and important. Due to increasing population and limited number of doctors, their practices are loaded and creates too much of stress. As a result, the quality management suffers. There is potential among the clinical pharmacist to fill this gap.[16,17]

**Drug Information Sources**

Generally information sources are divided into three categories named primary, secondary and tertiary sources. Original articles in journals are the primary sources of information as they are the most updated and the best sources of information but they took lot of time to read and cost lots of money. Secondary sources of information such as bibliographic, indexing, abstracting services are quite useful for quick and selective screening of primary literature but they are also quite expensive to maintain. Tertiary literature sources such as books represent composite, condensed and compact information. Their main disadvantage is that the information tends to lag behind those in journals and convenient access to information and is probably the most commonly used reference materials. If the budget is limited they are the most appropriate source materials to acquire. The searching for answering the drug information queries should be in the following order: Tertiary source > Secondary source > Primary source.[18-21]

***1. Primary sources:***

Primary sources contain research studies or clinical experience which has not been previously published and they include the results of clinical events such as adverse drug reactions or unexpected clinical outcomes. Journals that publish primary literatures include Annals of Internal Medicine, Clinical Pharmacology and Therapeutics etc.

### 2. Secondary sources

Secondary sources provide an overview on past published work include indexing and abstracting services of the primary literature. They include IOWA drug information service (IDIS), Medline, International Pharmaceutical Abstracts (IPA), Clinalert, PubMed from the National Library of Medicine etc.

### 3. Tertiary sources

Tertiary sources contains general literature including textbooks and references like American Hospital Formulary Services (AHFS), Martindale the Complete Drug reference, Meyer's side effects of drugs, Remington's Pharmaceutical Sciences and United States Pharmacopoeia Drug Information (USPDI). These sources provide composite, condensed and compact information. While evaluating tertiary literature we should consider expertise and experience of author, correctness of literature, appropriateness of the citations used, clarity, conciseness and ease of use of the literature.

### 4. Electronic bulletin boards

Electronic bulletin boards are local bulletin boards, which are posted through a server and can be used with the help of a computer and a modem e.g. Clinnet, Pharmline and Pharmnet. They enhance the ability to monitor therapies recently published or discussed in the media and prevent duplication of drug information searches.

### 5. Other drug information resources

When queries cannot be answered using the above mentioned resources, alternate sources of drug information can be accessed. They primarily include local and national webpage's, professionals and government organizations and pharmaceutical manufacturers. The ability to use the quality of information obtained from the web is increasingly important for pharmacists for the benefit of patients as well as of their own. In order to ensure the quality of information obtained through the web, pharmacy professionals need to be aware of the criteria to evaluate the web as they are for other traditional sources.

### 6. Some Useful Internet Web Resources

World Health Organization: http://www.who.int

Australian Prescriber: http://www.australianprescriber.com

British Medical Journal: http://www.bmj.com

The Free Medical Journal: http://www.freemedicaljournals.com[22,23]

**Indian Scenario and Startup**

In 1997, the drug information services were started in India at Jagadguru Sri Shivarathreeshwara (JSS) in Mysore, Trivandrum Medical College (TMC) in Thiruvananthapuram and Karnataka State Pharmacy Council (KSPC) in Bangalore. The drug information centre of Karnataka State Pharmacy Council (KPSC) started an independent drug information centre. This centre provides unbiased drug information to many hospitals and general practitioners of Bangalore city and some hospitals in Karnataka. The Karnataka centre produced standard treatment guideline and an essential drug list for Karnataka in coordination with Delhi society for promotion of rational use of drugs (DSPRUD).[14] Many centre's providing drug information have since been established in many hospitals and the National Human Rights Commission (NHRC) has recommended the establishment of such centre's in every hospital. The successful establishment of this service by the clinical pharmacy department has motivated other institutions to establish the same services in their hospitals.[24] Table 1 showed a list of independent drug information centre in India and Table 2 showed a list of hospital attached drug information centre in India.

**Table 1:** List of Independent Drug Information Centre in India[25-27]

| S.No. | Independent Drug Information Centre |
|---|---|
| 1 | CDMU Documentation Centre, Calcutta |
| 2 | Drug Information Centre, Maharashtra State Pharmacy Council, Maharashtra |
| 3 | Andhra Pradesh State Pharmacy Council, Andhra Pradesh |
| 4 | Karnataka State Pharmacy Council (KSPC), Bangalore, Karnataka |
| 5 | JSS, Ooty |
| 6 | Pharma Information Centre, Tamilnadu, Chennai |
| 7 | Drug Information Centre, Girijananda Chowdhury Institute of Pharmaceutical Science (GIPS), Guwahati, Assam |
| 8 | Drug Information Center, Laureate Institute of Pharmacy, Jwala ji, Kangra, Himanchal Pradesh |

**Table 2:** List of Hospital attached Drug Information Centre in India[25-27]

| S.No. | Hospital attached Drug Information Centre |
|---|---|
| 1 | Christian Medical College Hospital Vellore, Tamil Nadu |
| 2 | Drug Information Centre, (KSPC), Victoria Hospital, Bangalore, Karnataka |
| 3 | Drug Information Centre, (KSPC), Bowring & Lady Curzon Hospital, Bangalore, Karnataka |
| 4 | Department of Pharmacy Practice, Chidambaram, Tamil Nadu |
| 5 | Department of Pharmacy Practice, National institute of Pharmaceutical Education and Research (NIPER), Chandigarh |
| 6 | Jawaharlal Nehru Medical College Hospital (JNMC), Belgaum, Karnataka |
| 7 | JSS, Mysore, Karnataka |
| 8 | JSS, Ooty, Tamil Nadu |
| 9 | N.R.S. Medical College & Hospital, Calcutta, West Bengal |

| | |
|---|---|
| 10 | Kempagowda Institute of Medical Sciences (KIMS), Bangalore, Karnataka |
| 11 | Kasturba Medical College (KMC), Manipal, Karnataka |
| 12 | Poison Information Centre, All India Institute of Medical Sciences (AIIMS), Delhi |
| 13 | Poison Information Centre, National Institute of Occupational Health, Ahmedabad, Gujarat |
| 14 | Department of Toxicology (Incl. Poison Information & Laboratory Services) Amrita Institute of Medical Sciences & Research, Cochin, Kerala |
| 15 | Toxicology & IMCU Unit, Government General Hospital, Chennai |
| 16 | Sri Ramachandra Hospital, Porur, Chennai |
| 17 | Sri Ramakrishna Mission Hospital, Coimbatore, Tamil Nadu |
| 18 | Trivandrum Medical College, Trivandrum, Kerala |

**Challenges in Establishing a Drug Information Centre in India:**

Although establishment of DICs offers benefits in terms of addressing the information of health-care professionals and improved patient care, there are many challenges that have to be face while setting up these centres. The major challenges include:

- **Funds and Resources**

In resource-limited developing countries, the major difficulty in establishing a DIC comes in the form of constraint of funds. For the establishment and running DIC services successfully requires a good supply of recurring and non-recurring budgets. Since departmental budgets in such disciplines are low in India, the expenses may act as a deterrent to the establishment of a stand-alone DIC. So, DIC could also provide some other services such as poison information, adverse drug reaction monitoring, and training of postgraduate students of relevant disciplines to justify its budgetary requirements.

- **Human Resources**

To provide accurate drug-related information, it requires trained and experienced individuals in the DIC.[38-33]

## CONCLUSION

DICs have existed since the 1960s and their full potential has not been explored, especially in developing countries. Future growth in the number of centres will be limited; their present activities will become more refined and productive if the above mentioned challenges are appropriately overcome. In India, DICs within academic centre's can collaborate with the existing in-house department of complementary and alternative medicines (AUYSH) to provide information about related medicines. Novel initiatives such as providing TDM service, adverse drug monitoring and collaboration with forensic scientists for identification of remove substances, forensic pharmacology, postmortem toxicology, and providing expert testimony can be replicated in India too. Other activities such as online or offline academic detailing where specially trained pharmacists/ pharmacologists with detailed medication knowledge interact with physicians to share the best practices of prescribing have been described as a means of promoting evidence-based medicine practices and rational use of drugs. Such activities will yield positive results if tried in Indian settings.

In developed countries, information flow is usually satisfactory and at times even too much, but most developing countries suffer from lack of proper information. Reasons for inadequate provision of independent drug information in developing countries may include: limited availability of information sources such as recent books and journals; poor documentation and dissemination of whatever little information is available; poor or no information exchange/inter-library loan services; slow and often inefficient mechanisms of information procurement from other countries; general lack of standard treatment guidelines and formularies in health facilities; personalizing information by those who receive it; lack of access to or familiarity with computers; deficiency of modern communication and information reproduction facilities; and unrestricted promotional activities of pharmaceutical companies. Although much needed, organized drug information centres are still rare in developing countries. Therefore, highly important that pharmacologists, clinical pharmacologists and pharmacists of the developing world take in active role in establishing independent drug documentation and information centre's. Since it is usually very difficult in developing countries to acquire all the recommended books, journals, databases, computer and other equipment before starting an information service, we can start the activity with whatever resources we have and slowly build on that. If we can show our commitment and usefulness, it then becomes easy to convince the local authorities as well as possible international donors to provide further assistance.

## REFERENCES

1. Tipnis HP, Bajaj A, Clinical Pharmacy, 1st edition, Career Publications, Maharashtra, India, 2002, 1-4.
2. Parthasarathi G, Hansen KN, Nahata MC, A Textbook of Clinical Pharmacy Practice, Essential Concepts and Skills, 2nd edition, Universities Press (India) Private Limited, Hyderabad, India, 2004, 325-342.
3. Report of a 3rd WHO consultative group on the role of the pharmacist; Vancouver, Canada, 27-29 August 1997.
4. Dooley MJ, Bogovic A, Carroll ME, Cuell S, Galbraith KJ, Matthews H, SHPA Standards of Practice for Clinical Pharmacy, Journal of Pharmacy Practice and Research 35(2), 2005, 122-146. DOI:10.1002/j.2055-2335.2005.tb00322.x
5. Karin W, Rob SS, Clare AM, Andries GSG, Marthe E, Developing Pharmacy Practice A Focus on Patient Care, Hand Book 2006 edition, WHO Department of Medicines Policy and Standards Geneva, Switzerland, In collaboration with International

Pharmaceutical Federation, The Hague, the Netherlands, 2006.

6. Joshi MP, Drug information services in teaching hospitals in developing countries, Indian J Pharmacol, 30, 1998, 1-5.
7. Omole MK, Drug information service: lecture delivered at mandatory continuing professional development programme organized by pharmacists council of Nigeria, 4, 1998, 1-7.
8. Rosenberg JM, Drug information centres future trends, Am J Hospital Pharmacy, 40, 1983, 1213-1215.
9. Ramesh M, Parthasarathi G, Drug information - Role of Pharmacist, Indian J Pharma Education, 34(3), 2000, 120-123.
10. Kasilo OJ, Nhachi CF, Recommendations for establishing a drug and toxicology information center in a developing country, Ann Pharmacotherapy, 25, 1991, 1379-1383.
11. Smith S, Bottle R, Use of information services by drug information pharmacists, Pharma J, 253(6810), 1994, 499-501.
12. Kumar MM, Sowmya B, Dinesh R, Karthik M, Nagar AK, Yogananda R, Amanpathan, Sivakumar, Evaluation of performance of drug Information center providing quality of information services to healthcare professionals in a tertiary care teaching hospital of south India, Innovations Pharm Pharmacotherapy 1(2), 2013, 81-90.
13. Sreekanth SK, Sreekanth D, Need and importance of drug information centres in Indian Hospital system, Int J Med Health Profession Res 2015, 2(1), 9-16.
14. Mohanta GP, Kumar IV, Manna PK, Manavalan R, Independent, Unbiased Drug Information: A Need to Promote Rational Drug Use, The Pharma Review 30, 2005.
15. Thomas M, Mathai D, Cherian AM, Seshadri MS, Ganesh A, Moses P, Promoting Rational drug Use in India, World Health Forum, 16, 1995, 33-35.
16. Lal A, Sethi A, Drug Package Inserts in India, Ann Pharmcother, 30, 1996, 1041.
17. WHO Policy Perspectives on Medicines Promoting Rational Use of Medicines; Core Components, September 2002, WHO, Geneva.
18. Hudson SA, Walker RW, Drug Information and Pharmaceutical Advice, In, Collett DM, Aulton ME, Pharmaceutical Practice. Britain, ELBS, 1991, 421-431.
19. Brizuela BS, Hesp JA, Drug Information, In, Gennaro AR, edition, Remingtons Pharmaceutical Sciences, Mack Publishing Company, Pennsylvania, 1990, 49-59.
20. UK drug information manual, England, The Drug Information Pharmacists Group of the UK, 1992.
21. Kasilo OJ, Nhachi FB, How to establish a drug and toxicology information centre in a developing country, Essential Drugs Monitor, 16, 1993, 8-9. PMID: 12319054.
22. Banker GS, Chalmers RK, Pharmaceutics and Pharmacy Practice, J.B. Lippincot Company, Philadelphia, 1982, 155.
23. Aja GN, ABC of Rational Use of Medicines, Agbo Areo Publishers, Ibadan, 2001, 32.
24. Phadke AR, The Quality of Prescribing in an Indian District, National Medical Journal of India, 9, 1996, 60-65. PMID: 8857039.
25. Malik M. Drug Information Services - An Emerging Practice in India - A Review, Pharmacologyonline, 2, 2010, 85-90.
26. Thireesha P, Mounika K, Adusumilli PK, Harsha SC, An overview of drug information center - Functions and challenges in India, Asian J Pharm Clin Res 13(5), 2020, 11-15. DOI: 10.22159/ajpcr.2020.v13i5.37052.
27. Chauhan NS, Firdous, Raveendra R, Geetha J, Gopalakrishna B, Karki R, Drug Information Centre (DIC) - An Indian Scenario, Indian J Pharm Pract 1(2), 2009, 21-27.
28. Khaliq A, Sayed SA, Drug and poison information centres: An emergent need for health care professionals in Pakistan, J Pak Med Assoc, 66(6), 2016, 639-643. PMID: 27339560.
29. Joshi MP, University hospital-based drug information service in a developing country, Eur J Clin Pharmacol, 53(2), 1997, 89-94. DOI: 10.1007/s002280050343; PMID: 9403277.
30. Gitanjali B, Opportunities and challenges in conducting medical research in India: Food for thought, J Pharmacol Pharmacother, 2(2), 2011, 71-73. DOI: 10.4103/0976-500X.81894; PMID: 21772763.
31. Lall SB, Peshin SS, Role and functions of poisons information centre, Indian J Pediatr, 64(4), 1997, 443-449. DOI: 10.1007/BF02737746; PMID: 10771872.
32. Kshirsagar NA, Bachhav SS, Kulkarni LA, Vijaykumar, Clinical pharmacology training in India: Status and need, Indian J Pharmacol, 45(5), 2013, 429-433. DOI: 10.4103/0253-7613.117718; PMID: 24130374.
33. Ananthakrishnan N, Arora NK, Chandy G, Gitanjali B, Sood R, Supe A, Nagarajan S, is there need for a transformational change to overcome the current problems with postgraduate medical education in India, Natl Med J India, 25(2), 2012, 101-108. PMID: 22686720

**Source of Support:** None declared.

**Conflict of Interest:** None declared.