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Review Paper

Evolving Role of Clinical Pharmacists in Patient-Centered Care: Bridging Gaps in Indian Healthcare Practice

**Nalam Vineela Nirmala¹, Mekala Keerthi Priya², Avanigadda Niharika³,
Choddabattina Rajkumar⁴, Muthineni Pradeep Kumar⁵, Lingineni Mani Deepa
Chandrika^{6*}**

^{1,2,3,5,6} Pharm D, KVSRR Siddhartha College of Pharmaceutical Sciences, Vijayawada, Andhra Pradesh, Pin code-520008, India

⁴Nalanda Institute of Pharmaceutical Sciences, kanteputi (v). Sattenapalli (m), Guntur (Dist.)- 522438.

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ABSTRACT

Worldwide, clinical chemists are gaining increased recognition as part of the healthcare team, leading to patient-focused care activities beyond merely dispensing medications. The clinical chemist's role in India is in its infancy with the potential to bridge significant gaps in healthcare access. The purpose of this review is to highlight some of the new roles clinical chemists can provide to improve therapeutic outcomes, medication safety, and the responsible use of medications. Evidence shows that clinical chemists reduce medication errors, facilitate patient-centred consultation, and enhance antimicrobial stewardship and other quality measures. However, there are still considerable barriers, namely: health professional low awareness of the contribution of clinical pharmacy; the absence of regulation; and limited integration into the healthcare workforce. Moving forward to maximize clinical pharmacy involvement, three key recommendations need to be made: (a) improve-of clinical pharmacy education, (b) developing policy to support the integration of pharmacy practice and (c) support interprofessional collaboration in practice. These barriers continue to create barriers to a sustainable patient-centered model of care and to support the Indian healthcare model to be consistent with global standards of care.

INTRODUCTION

Globally, the practice of clinical pharmacy has evolved from a traditional role of medication dispensing to a modern, patient-centered process

***Corresponding Author:** Lingineni Mani Deepa Chandrika

Address: Pharm D, KVSRR Siddhartha College of Pharmaceutical Sciences, Vijayawada, Andhra Pradesh, Pin code-520008, India.

Email ✉: linginenimanideepachandrika@gmail.com

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that maximizes direct patient care, patient-centered drug therapy planning, and collaborative practice with other healthcare professionals. This change signifies a revolution in health care. Pharmacists are essential members of the management process for pharmaceutical therapy, patient education, and the personalized care planning process and are becoming increasingly viewed as core members of multidisciplinary health care teams **Error! Reference source not found.** The movement toward more personalized health care has evolved due to increased communication, coordination, and collaboration between patients and care providers through the use of technology and resources such as EHRs, telehealth, and digital monitoring **Error! Reference source not found.** Central to this movement is patient-centered care (PCC), which recognizes that patients' decisions, values, and engagement about care ultimately leads to more satisfaction, adherence to treatment recommendations, health care outcomes, and fewer avoidable hospitalizations **Error! Reference source not found.** Additionally, by educating and engaging patients, PCC empowers them and provides them with a perceived level of control about their medical treatment while improving communication and cooperation with clinicians **Error! Reference source not found.** This trend is particularly significant for Indian health care because the system is evolving to meet targets for universal health coverage, reduce gaps between public and private sector institutions, and expand access while containing the cost of care. Yet, there have been ongoing challenges related to poor infrastructure in rural areas, inequities in access to health care between urban and rural areas, and underfunding **Error! Reference source not found.** The country continues to scale up its use of innovative technologies, including telemedicine, electronic health records, and health

information systems, in order to improve care processes and outcomes **Error! Reference source not found.** In concert with a global trend in the advancement of clinical pharmacy practice and expansion of their role as essential components of patient-centered care and healthcare reform, Indian pharmacists are distinctly adopting broader roles within clinics, mainly medication management, therapeutic optimization, and health education **Error! Reference source not found.**

2. HISTORICAL CONTEXT OF CLINICAL PHARMACY IN INDIA

Pharmacy education in India started with the establishment of the first schools of pharmacy in the early 20th century where the student training focused mainly on compounding and dispensing. The growth and development of clinical pharmacy in India reflect a dramatic transformation of this profession from being centered around mere dispensing to being patient care-centered, influenced largely by earlier developments in education, regulation, and changing patient expectations. Technical and professional skills were emphasized, not the art of patient care. This training preceded the establishment of the Pharmacy Council of India in 1948, which came into being with the passage of the Pharmacy Act, 1948. With this development, diploma and degree courses were introduced, which gave a semblance of standardization to pharmaceutical education. Nonetheless, the orientation still remained predominately technical; chemists were still recognized mainly as prescriber checkers tasked with the responsibility for the safekeeping of drugs and the provision of limited prescription information. They were not expected to engage in clinical contributions or in direct patient care activities. Since their predominant role was that of intermediaries between doctors and patients, the scope of practice for chemists and recognition of their professional identities as members of



healthcare teams were often limited. However, the growth of clinical pharmacy as a distinct discipline in the latter half of the 20th century, impelled by the fast-growing recognition of the pivotal role that the management of medicines plays in improving patient health, heralded significant changes. This direction first gained momentum in the early 2000s when pharmacy schools began to offer the degree of Doctor of Pharmacy. The aim of the program was to equip the students with clinical as well as patient-care skills, including the management of drug therapy and clinical rotations. These training and educational programs heralded a major shift toward a patient-centered practice model **Error! Reference source not found..** These changes in education have also brought into sharp focus the importance of the use of knowledge about clinical medicine and medication therapy by chemists.

3. CONCEPT OF PATIENT-CENTERED CARE

Patient-Centered Care (PCC) is a transformational healthcare model which is patient driven, with active participation from patients regarding their care, and clinical decisions made based on their needs, preferences, and values rather than that of the conventional provider-point of view. PCC is based on salient characteristics of respect and responsiveness within a system which requests and includes the unique values of patients into care. Essentially, PCC is founded on the basic tenets of shared decision-making, patient empowerment, and holism of care. Shared decision-making focuses on collaboration with the person receiving care, acknowledging the unique journey of a patient, and inviting patients to be engaged and involved in treatment decisions to result in increased engagement and satisfaction**Error! Reference source not found..** Patient empowerment is defined as the prep to allow individuals with the knowledge, skills, and self-

efficacy to self-manage their condition through education on the condition, treatment, and anticipated outcomes, which can result in more improved adherence and self-management **Error! Reference source not found..** Holism or whole person care extends beyond physical symptoms to emotional, social, and spiritual elements acknowledging all of the diverse factors that can contribute to health and wellbeing **Error! Reference source not found..** We can see how these definitions of PCC lead to the call for providers being part of a multidisciplinary team (MDT) where the voices and expertise from healthcare professionals across all disciplines engage in the support of a person's care. MDTs improve care through coordinated expertise, improved communication, and a more unified patient experience, especially for patients with complex or chronic conditions**Error! Reference source not found..** Pharmacy services are a critical function of PCC by coordinating medication management according to patient needs, providing individualized care, and aiding decision-making in collaborative practice within MDTs. Pharmacists provide accessible education of their patients about their medications, adjust regimens for individual lives, address barriers such as cost or availability, and advocate for better access to appropriate therapies **Error! Reference source not found..** If we are willing to consider these three areas—PCC principles, the multimodal collaboration role, and the convergence of pharmacy service provision—health care systems can create an environment which enhances patient outcomes as well as satisfaction, trust, and empowerment, and transforms the focus from treatment out of disease to care that is focused on the patient. As illustrated in [Figure 1](#), patient-centered care integrates pharmacy services, multidisciplinary teams, holism of care, patient empowerment, and shared decision-making, all of which contribute to improved patient outcomes



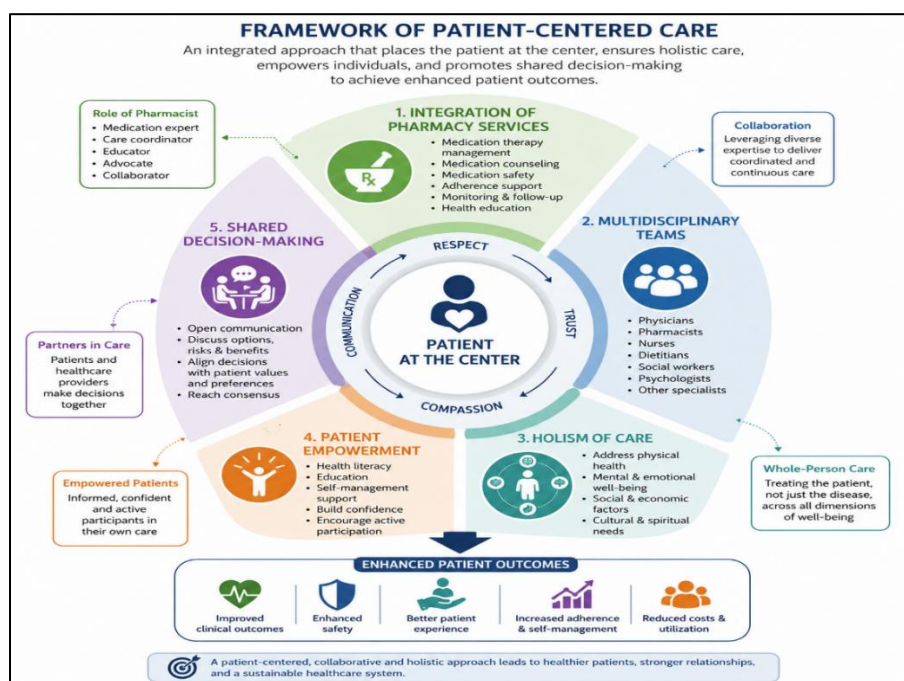


Fig.1: Framework of patient-centered care for improved patient outcomes

4. EVOLVING ROLE OF CLINICAL PHARMACISTS:

Clinical chemists now play a major role in patient care, including medication therapy management (MTM), drug utilisation reviews, pharmacovigilance, adverse drug reaction (ADR) monitoring, patient education, chronic disease management, antimicrobial stewardship, and pharmacoeconomics. Their role used to be limited to simply dispensing medication. Pharmacists in MTM perform thorough medication reviews, identify drug-related issues, create patient-specific plans, encourage adherence, minimise side effects, and lower care costs; however, the greatest cost savings are seen in chronic conditions like diabetes and hypertension **Error! Reference source not found.** By identifying and reporting adverse drug reactions (ADRs), keeping an eye out for safety, and focussing on prescribing optimisation, they contribute to safe and effective drug use **Error! Reference source not found.** They also keep track of and document adverse drug reactions (for

example, as input to national reporting schemes) and inform other medical professionals about possible patient adverse reactions **Error! Reference source not found.** As they advise patients on medication adherence, lifestyle modifications, and long-term illness management, patient education and counselling further solidify their role as illustrated in [Figure 2](#). With the ability to customise pharmaceutical therapy, alter therapies, and collaborate with interprofessional teams to enhance patient outcomes, their abilities are essential in long-term disease management. Pharmacists contribute significantly to antimicrobial stewardship initiatives by training other medical professionals on proper prescribing practices, evaluating resistance trends, and encouraging the rational prescription of antibiotics. Their contributions to pharmacoeconomics and cost-effective therapy planning also help healthcare organisations strike a balance between resource optimisation and quality care **Error! Reference source not found.**

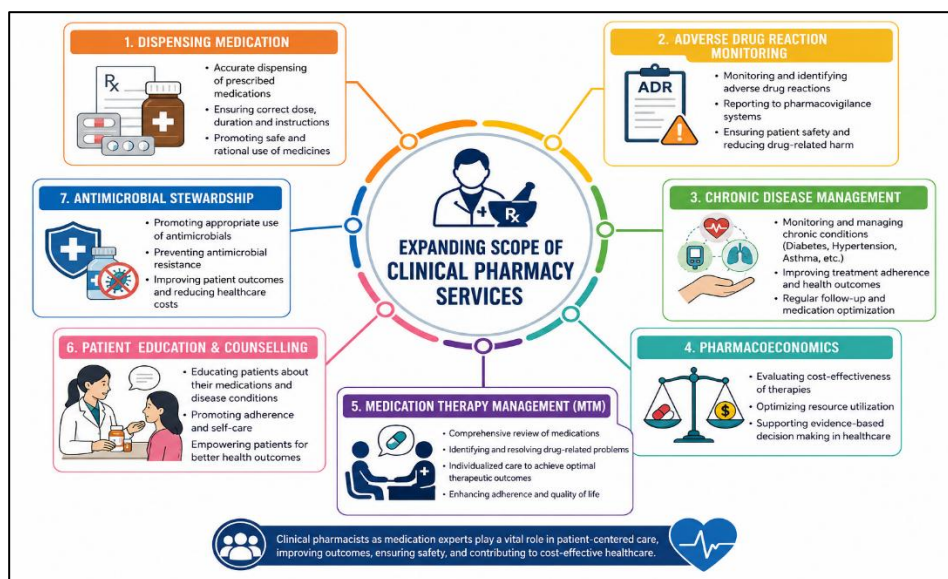


Fig.2: Expanding scope of clinical pharmacy services in patient-centered care

5. CLINICAL PHARMACISTS IN INDIAN HEALTHCARE PRACTICE:

The clinical pharmacist profession in India has been changing, especially improving healthcare provision and patient outcome through their incorporation in hospitals, community pharmacies, and rural healthcare systems. Practice of clinical pharmacy in India is still in its infancy relative to the West, with national surveys indicating that clinical pharmacy activities are more frequent in upper-class hospitals with an emphasis on non-patient-related activities like pharmacovigilance and medication information, rather than patient-centered services like counselling and ADR monitoring, which are still less well-established **Error! Reference source not found.** In tertiary care hospitals, clinical pharmacists make important contributions to drug utilization review, medication therapy management, patient education, and antibiotic stewardship programs to reduce antibiotic resistance **Error! Reference source not found.** They provide important support to primary care, meaning medication reconciliation during transitions of care to avert possible medication

errors, and care continuity **Error! Reference source not found.** Their accessibility in rural regions is key to alleviating some of the challenges around limited access to health care, such as their provision of medication management and therapy, which are still very much in development. Interprofessional integration with physicians, nurses, and other healthcare professionals via collaborative practice models has proved better outcomes in the management of chronic diseases, best use of medication, and increased safety, while pharmacists also add value to educating healthcare teams on medication safety and best practices as mentioned in [Table 1](#). Some models report their success, such as antimicrobial stewardship programs that enhanced antibiotic prescribing, medication reconciliation programs that decreased errors and increased safety, and community pharmacy services that increased adherence and outcomes for patients in chronic disease treatment. In addition, the institution of PharmD programs has solidified the groundwork of clinical pharmacy practice by educating future professionals able to tackle India's health issues. In summary, despite the fact that the clinical pharmacy practice in India is still developing, the improvements made on the

integration of clinical pharmacy into health care system supports evidence of the importance of clinical pharmacy roles on medication management, patient safety, and public health.

Table1: Key Roles of Clinical Pharmacists in Indian Healthcare Practice

Area	Core Role	Outcome
Medication Management	Prescription review and dose optimization	Reduced medication errors
Patient Counseling	Education on drug use and adherence	Improved treatment compliance
Clinical Ward Services	Participation in ward rounds	Rational drug therapy
Pharmacovigilance	ADR monitoring and reporting	Enhanced drug safety
Chronic Disease Care	Therapy monitoring in long-term illnesses	Better disease control
Antimicrobial Stewardship	Optimization of antibiotic use	Reduced antimicrobial resistance

6. CHALLENGES AND BARRIERS IN INDIA:

Clinical chemists have not been able to significantly improve patient care in India's healthcare system due to a number of obstacles and difficulties that still exist today. The lack of knowledge among patients and medical professionals on the function of a clinical chemist is a significant obstacle. The majority of doctors and nurses still don't realise that chemists are more than just pharmaceutical providers; they are essential members of the therapeutic team. This diminishing of the clinical chemist's involvement in drug administration and therapy optimisation shows that the chemist has limited influence over providing patients with the best possible care. In a similar vein, many patients receive care without realising that chemists can also offer beneficial services including drug counselling, chronic illness management, and lifestyle modification that can enhance their results **Error! Reference source not found..** The unclear role of clinical chemists in healthcare practice and policy is a significant barrier. Despite efforts by the Pharmacy Council of India to promote clinical pharmacy education, national policies outlining the role of pharmacists in many healthcare domains remain ambiguous and inconsistent. These difficulties are exacerbated by workforce shortages and unequal distribution. Clinical

pharmacists are largely concentrated in urban areas and big tertiary care hospitals, with negligible representation in rural and underprivileged communities with inadequate access to basic drug management services. Because rural residents typically need more services for managing chronic diseases yet lack access to speciality pharmacy services, the disparity will exacerbate healthcare disparities. Additionally, urban pharmacies deal with a lot of work every day, which causes stress, burnout, and lower service quality **Error! Reference source not found..** The advancement of the profession will also be hindered by disparities in education and training. Although the Pharm.D. program's inclusion was a positive step, the majority of pharmacy programs in India still place little emphasis on clinical abilities, patient-interaction skills, evidence-based practice, and teamwork (interprofessional education). Graduates' confidence, competency, and capacity to improve patient care will be negatively impacted by their inability to quickly adjust to real-world clinical practice due to a lack of clinical exposure throughout training. Another obstacle to the complete integration of clinical chemists is institutional and regulatory constraints. Long-term clinical positions are prohibited under the existing regulatory framework, which also restricts chemists' ability to use their education and experience to guide patient care. The difficulties



are exacerbated by organisations' reluctance to fund and support specialised clinical pharmacy services because hospital and healthcare institutions lack the means or are unwilling to do so. Pharmacists are compelled into a silo that continues to concentrate their practice on traditional dispensing tasks in the absence of acknowledgement of the clinical pharmacist position and involvement from healthcare or hospital organisations **Error! Reference source not found.** The practice of clinical pharmacy in India is still hindered by a number of variables, including systemic hurdles, labour shortages, restricted access to workforce training, and a lack of role recognition and implementation policies. The government must take coordinated action to change regulations in order to address these problems. Healthcare organisations must also

commit to investing in and promoting a clinical pharmacist role, updating clinical training, and making a real effort to promote clinical pharmacists to the general public and all healthcare providers in order to ensure that these clinicians can practise at their best while optimising patient outcomes. As shown in [Figure 3](#), clinical pharmacy practice faces several challenges such as minimal awareness of the pharmacist's clinical role, uncertain recognition within healthcare policy, uneven distribution of pharmacists leading to workforce deficits, educational discrepancies hindering professional development, and regulatory barriers that limit direct patient care

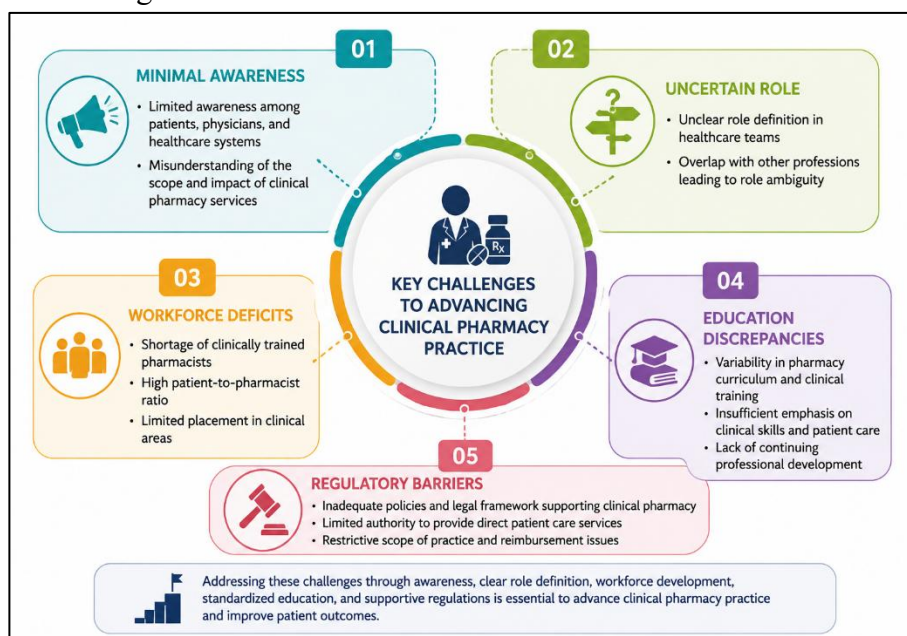


Fig.3: Key challenges to advancing clinical pharmacy practice.

7. OPPORTUNITIES AND FUTURE DIRECTIONS:

The Indian healthcare system is changing quickly, which provides a prominent role for clinical chemists (both individually and collectively) to make an important contribution to improvement in

patient care. There are many opportunities specifically for all pharmacists to create impactful contributions to care through digital health, adjusting laws due to the presence of infectious and chronic disease, along with especially given the rapid growth of telemedicine, telepharmacists, and collaborative practice (with those more

qualified than each pharmacist) and personalized care and engaging in the policy world as well as research.

As a direct result of the Covid-19 pandemic, the acceptance and establishment of regularly used telemedicine equitably increased virtual capabilities of care delivery, particularly remotely managing drug therapy, some counselling, and even surveillance of chronic disease follow-up. Telepharmacy significantly increases patient education and patient activation; it enables real time monitoring, and it furthers compliance in using digital health devices (such as wearable's, apps) **Error! Reference source not found..** Another important opportunity is forming and structuring relationships with other professionals (like physicians, nurses, and other related professionals). In terms of decision-making, an engaged team will have a more effective outcome in determining safe and effective drug use (for patients on complex drug regimens) while reinforcing the required structure of collaborative decision-making and collaborative care. In addition to the role pharmacologists play in collaborating, they are also educators to other health professionals on safe drug use and good prescribing habits **Error! Reference source not found..** The chemist is placed in an important role with the use of pharmacogenomics and the rise of personalized medicine..They are able to help in investigations in this emerging field, reduce poor reactions, inform patients regarding genetic screening, and drive individualized therapy by interpreting genetic information **Error! Reference source not found..** There is a need for supportive policies in order to fully utilize such potential. Pharmaceutical safety, antimicrobial stewardship, and chronic disease management roles of clinical chemists would be supported by national standards as well as incorporation into healthcare policy. Finally, research remains a valuable path.

Demonstrations of the efficacy of pharmacist interventions in improving outcomes, adherence, and safety are documented in clinical trials and patient safety initiatives that can be led or supported by pharmacists **Error! Reference source not found..**

8. BRIDGING THE GAPS IN INDIAN HEALTHCARE:

Sponsorship and funding options are best-administered through the Health Services agency as a general fund because the needs for pharmacy services usually centre on major centralization issues and systemic issues involving the Health Services system. The work of pharmacists supports working as part of a team, particularly if we are included in multidisciplinary care teams with clearly defined roles in clinical pathways and support with managing medications and patient counselling and monitoring **Error! Reference source not found..** Using training programs that incorporate elements like interprofessional education and mentorship programs would support more collaboration between pharmacists and the engagement of new pharmacists into clinical practice **Error! Reference source not found..** We will be able to create national or licensing frameworks, with common protocols, applying the existing literature and work in progress, working through the scope of practice and positioning consistent policies across institutions **Error! Reference source not found..** By implementing improvements in education based in competency-based programs, increasing access to clinical practice, facilitating continued professional development, and establishing strong certification practices, we can develop a competent workforce that can tackle 21st-century health challenges **Error! Reference source not found..** Finally, through public education related to patient-focused feedback systems, outreach initiatives, and shared decision-making, in collaboration with



public health education, patients will be better engaged and informed to effectively access clinical pharmacy services, thereby improving health outcomes and the pharmacist-patient relationship.

9. CASE STUDIES / BEST PRACTICES:

Pharmacy clinical services in India are slowly developing, with various hospitals successfully implementing them to enhance drug management and patient care. Apollo Hospitals has pioneered, initiating ward pharmacy services, an imprest stock system, and telemedicine-based pharmacy practice that greatly minimized medication errors and improved chronic disease control. Similarly, the Queen Elizabeth Central Hospital (QECH) piloted a multidisciplinary ward pharmacy service which improved medication reconciliation, patient facing clinical care and education for patients and staff, demonstrating the value of having clinical pharmacists serving in the hospital environment **Error! Reference source not found..** Broader studies have also quantified the position that clinical pharmacy has on chronic disease management across India, where pharmacists support in reducing medication errors, avoiding adverse drug events and decreasing unnecessary cost to health systems to provide enhanced therapeutic outcomes **Error! Reference source not found..** There are also international learning examples which could be adapted to India: in the USA, pharmacist-led interventions such as the Cardiac Transitions of Care Program, have reduced readmission for patients with heart failure and myocardial infarction, demonstrating the opportunity of Indian pharmacists in similar positions **Error! Reference source not found.;** in the UK, the inclusion of pharmacists within NHS primary care teams has increased medication reviews and patient education, thus showcasing opportunities for Indian hospitals to integrate pharmacists within outpatient and community care

Error! Reference source not found. **DISCUSSION**

Clinical pharmacy services development in India has gained increased momentum in recent years, but the system is still facing imperative challenges limiting its full expression. Recent trends indicate increasing recognition of clinical pharmacists as valuable members of patient care, specifically in drug error reduction and outcomes improvement in chronic disease management. Educational progress and more so through the opening of the Pharm.D program, has created a workforce with strong theoretical bases, though whose practice in the clinical arenas is poorly developed **Error! Reference source not found.:** Despite such advancements, enormous gaps remain: few hospitals have formalized clinical pharmacists as members of patient care teams on paper, there are few opportunities for practitioners' ongoing education, and the evolving regulatory environment contributes to the heterogeneity of practice within the country. When compared with the global standards, it is a stark contrast. Clinical pharmacists are strongly integrated into the healthcare systems in America and Europe, with active involvement on ward rounds, influencing prescribing, and having tangible improvements on patient safety and outcomes **Error! Reference source not found..** India, however, lags behind in this regard, with the participation of pharmacists in multidisciplinary teams not yet being the norm. Similarly, while developed nations have established systems of structured training and certification to make practice-ready **Error! Reference source not found.,** Indian curricula lack sufficient exposure to clinical environments, thereby creating a deficit in academic preparation and practice demand. The role of chemists is well defined by the regulatory structures of the nations where there are effective pharmacy services, which also routinely enable their inclusion in models of care. Conversely, the



policies in India are still being developed and require further substantial revision in order to move toward a state of accountability and standardisation. Effective clinical pharmacy services in India could have considerable impact. For chronic disease states that have been prevalent in India, such as diabetes, hypertension, cardiovascular disease, the chance of improved compliance, greater selection of treatment plans, and cost-effective better outcomes, as a result of involvement in chronic disease management, is of potential consequence. Furthermore, there is considerably reducing the cost to the healthcare system; research evidence from around the world shows providing clinical chemists will lower healthcare costs, offering a further economic and quality return on investment by preventing avoidable complications and readmissions. Collectively based on this research foundation, it is quite reasonable to consider improving clinical pharmacy in India as the strategic means to improve patient care, added to provision of patient safety, and affordable provision of healthcare.

CONCLUSION

India's clinical pharmacy services are growing at a noticeable rate, but they also face considerable obstacles that must be balanced with the country's current achievements and the potential for major reforms in the future. Clinical chemists' contributions to patient care are being increasingly acknowledged, particularly in crucial areas such as safe medication usage, minimising adverse drug responses, and practicing on challenges associated to the growing burden of chronic diseases. They are in a prime position to reduce problems, improve treatment results, and enhance patient safety in general. The creation of a new workforce skilled in clinical reasoning and patient-centered assessments has been revolutionised by the launch of the Doctor of Pharmacy (Pharm.D) program. Clinical chemist standardised positions and

infrastructure are frequently inadequately provided by hospitals across the nation, and opportunities for ongoing professional growth and participation are occasionally nonexistent. The Indian model is still in its early stages when compared to sophisticated healthcare systems in nations like the United States, the United Kingdom, and Australia. Clinical chemists have a position in treatment planning and patient monitoring as members of multidisciplinary teams in these nations. This is in stark contrast to India, where only a small number of institutions have made an effort to create a comprehensive clinical pharmacy program, and the majority of hospitals employ clinical pharmacists in a restricted and dispersed fashion. However, there is a lot of scope for clinical pharmaceutical services to create value in India. This can be accomplished if clinical pharmacists optimise medication therapy for individualised patients using evidence-based clinical judgement in order to cut drug therapy costs, enhance adherence, minimise errors, and prevent needless admissions. Additionally, at a time when lifestyle-related disorders are becoming common in India, clinical pharmacy interventions might improve chronic disease management services. Systemic transformation is the only way to realize this promise. First, pharmacy education needs more exposure and real-life experience if it is to effectively educate students for the breadth of practice needed in clinical practice. Second, national health policies and a regulatory framework that clearly spell out the role, scope, authority, and duty of clinical chemists should eliminate programmatic differences between institutions. Third, instead of traditional consultation-based service, opportunities for collaboration with doctors, nurses, and allied professions are required to engender team-based patient care. Finally, the country's pharmacy services can be upgraded and standardized by the introduction of internationally accepted standards



of good pharmacy practice, such as WHO or FIP standards. If these strategies are implemented, clinical chemists in India can evolve from an ignored profession to become vehicles for the delivery of safer, more effective, and truly patient-centered healthcare.

CONFLICT OF INTEREST: None

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