

Addressing Gaps and Challenges in Indian Healthcare through Integrating Clinical Pharmacy Services

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ABSTRACT:

The Indian healthcare system faces significant challenges, including inadequate patient counseling, limited access to specialized care, and rising chronic disease rates, all of which compromise healthcare quality and patient outcomes. Clinical pharmacy emerges as a promising solution by integrating pharmacists into healthcare teams. Clinical pharmacists enhance medication safety, optimize pharmacotherapy, and provide patient education, leading to improved treatment efficacy and reduced adverse drug reactions. Despite these advantages, challenges such as a lack of awareness of clinical pharmacy roles, limited institutional support, and insufficient policies impede its broader implementation. Strengthening clinical pharmacy education, defining roles within healthcare settings, and fostering interprofessional collaboration are crucial to overcoming these barriers. By addressing these issues, clinical pharmacy can significantly improve healthcare delivery and enhance patient quality of life in India.

Keywords: Clinical pharmacy, Non-communicable disease, Patient care, Adverse drug reactions, Pharmacovigilance.

I. INTRODUCTION

Non-communicable diseases (NCDs) represent a formidable health challenge on a global scale, and they are a pressing public health concern in India as well. [1,2] Accounting for approximately 38 million deaths worldwide-an alarming 68% of total fatalities and about 5.87 million deaths in India, NCDs lead to a significant demand for healthcare services and impose a considerable financial burden, particularly in low-resource settings. [3] In India, NCDs contribute to 16939 Disability-Adjusted Life Years (DALYs) per 100,000 people. A striking 50–70% of patients seek treatment in private healthcare facilities, highlighting the disparities in health service utilization, disease burden, and treatment costs

across different states. Karnataka notably reports the highest DALY rate at 25790 per 100,000, underscoring the urgency of addressing these ailments. Furthermore, hospitalization rates for NCDs escalated from 29% in 2004 to 38% in 2014, as recorded by the National Health Account.[4]

National Sample Survey (NSS) data indicates that 50–70% of individuals suffering from NCDs turn to private health facilities for treatment, though this varies significantly by state. Maharashtra, Andhra Pradesh, Karnataka, Telangana, Gujarat, and Punjab lead the way with a staggering 70–80% reliance on private care. In contrast, the North-Eastern states show a greater preference for public health facilities; Meghalaya and Sikkim report the lowest usage (58%), while Arunachal Pradesh tops the list at an impressive 92%.[4]

The financial repercussions of NCD-related hospitalization are stark around 47% of households face catastrophic healthcare expenditure (CHE) due to these diseases. Treatment in private facilities is particularly burdensome, forcing 66.3% of households into economic distress, compared to just 17.1% for those opting for public care. [4] Beyond their health implications, NCDs significantly impact productivity and economic growth. Alarming, the probability of dying from one of four major NCDs during the most productive years of life (ages 30-70) stands at a staggering 26%. As India's population continues to age and become more vulnerable to NCDs, the strain on both private households and healthcare systems is poised to intensify, necessitating immediate and effective action. [5]

Challenges in managing NCDs:

Medication nonadherence among patients with chronic diseases is extremely prevalent, affecting as many as 40% to 50% of individuals prescribed medications for managing conditions such as diabetes and hypertension. This lack of

adherence is believed to result in at least 100,000 preventable deaths and \$100 billion in avoidable medical costs each year. [6] Nonadherence poses a significant barrier to achieving optimal outcomes from appropriately prescribed medications, particularly in long-term conditions. [7] Research has shown that the duration of the disease significantly influences adherence to treatment. [8]

Several studies have confirmed that low adherence to therapy is linked to adverse health outcomes that extend beyond inadequate control of clinical parameters. In the cardiovascular realm, low adherence has been associated with an increased incidence of target organ damage (such as left ventricular hypertrophy and albuminuria) and cardiovascular events (including stroke, myocardial infarction, angina pectoris, and heart failure) in patients with hypertension, diabetes, or dyslipidaemia. Similarly, in nephrology, suboptimal adherence is associated with a heightened risk of decline in kidney function. Furthermore, a range of aspects related to disease management are negatively impacted by low adherence, leading to exacerbations of conditions that may result in acute hospitalizations, increased healthcare costs, and a reduced quality of life for patients. The multiple negative impacts of low medication adherence in chronic diseases highlight the urgent need for effective early recognition of this issue in clinical practice. [9]

Quality of life (QOL) is a crucial measure for assessing the impact of chronic diseases. [8] Non-communicable diseases (NCDs) significantly affect patients' physical, emotional, and social well-being, placing additional strain on caregivers and healthcare systems. Research indicates that nearly half of individuals with an NCD report a diminished quality of life. This, combined with the increasing burden of non-communicable diseases such as cardiovascular disease, cancer, diabetes, mental health issues, and injuries, places enormous demands on healthcare systems. [10,11]

Clinical pharmacy status in India:

The pharmacy profession is at the forefront of healthcare, urging pharmacists to continually adapt, expand, and refine their skills as they progress in their careers. This field has undergone a remarkable transformation over the years, particularly with the advent of clinical pharmacy and the principles of pharmaceutical care in the twentieth century. In India, the launch of the Doctor of Pharmacy (Pharm.D) program in 2008 heralded a significant turning point, transitioning the role of pharmacists from traditional dispensing

to a dynamic focus on patient-centered clinical care. Since its inception, this program has produced over 10,000 graduates, many of whom have become indispensable members of healthcare teams in hospitals. These professionals are actively engaged in vital tasks such as medication reconciliation, patient counseling, and adverse drug reaction (ADR) reporting. In leading private hospitals, clinical pharmacists contribute to ward rounds, antimicrobial stewardship, and pharmacovigilance, playing a crucial role in substantially reducing drug-related problems (DRPs). [12,13]

India, with a staggering population surpassing over 1.2 billion and an annual increase of 35 to 45 million, faces distinct healthcare challenges. A significant portion of the population resides in rural areas, where illiteracy, poor infrastructure, and inadequate healthcare facilities prevail. These conditions contribute to alarming rates of malnutrition, high maternal and infant mortality, and the underperformance of government health initiatives. In contrast, urban areas grapple with lifestyle-related issues such as smoking, excessive alcohol consumption, and chronic stress, which introduce a different array of health problems. [14]

Within the Indian healthcare system, physicians are primarily tasked with diagnosis and prescribing; however, pharmacists play a pivotal role in bridging the gap between medical advice and patient understanding, ensuring that individuals grasp their medication regimens. Many people increasingly depend on pharmacists for guidance, sometimes even more than on physicians. This growing reliance, coupled with challenges such as inadequate rural healthcare infrastructure, rising trends in self-medication, socio-economic disparities, insufficient implementation of rational drug use policies, and an acute shortage of healthcare professionals, underscores the urgent need to enhance clinical pharmacy services across the nation. Revamping the traditional role of pharmacists is not merely a choice—it is an imperative. By empowering Pharm.D graduates with advanced clinical knowledge and expertise in pharmaceutical care, India can tackle many of its systemic healthcare challenges head-on. These graduates not only alleviate the burden on physicians but also champion a safer, more effective, and patient-centered healthcare delivery system, ultimately enhancing the well-being of many individuals across the country. [14]

Clinical pharmacist role in patient care: Clinical Pharmacists in Reducing Medication Errors and Antimicrobial Resistance:

The burden of non-communicable diseases (NCDs) and antimicrobial resistance (AMR) has become increasingly pronounced in recent years, presenting substantial challenges to global health. In India, medication errors are alarmingly common, with estimates indicating that they occur at a staggering rate of approximately 5.2 million annually. This translates to an incidence of around 1.5 medication errors for every 100 prescriptions issued. While the majority of these errors may not result in significant harm to patients, some can lead to serious, temporary, or even permanent health complications, and in rare instances, may culminate in mortality. [13]

Among the various types of medication errors, prescription errors—often termed transcription errors—are the most prevalent. Following closely behind are errors related to dispensing and administration, which further complicate the safe management of patient care. [12,13] Compounding these issues is the imminent threat posed by antimicrobial resistance, which has emerged as a critical global health challenge in the 21st century. Projections indicate that if AMR is not addressed effectively, it could lead to an astonishing 10 million deaths annually by the year 2050.[15]

Antimicrobial resistance is not merely a theoretical concern; it is an ongoing epidemic contributing to exorbitant healthcare costs and heightened rates of hospital admissions. One significant factor driving AMR is the inappropriate and often excessive dispensing of antibiotics, a practice that is alarmingly prevalent in Indian healthcare settings. This misuse of antibiotics exacerbates the emergence of resistant pathogens, posing a grave threat to public health.[16]

Given the high prevalence of communicable diseases coupled with the excessive and indiscriminate use of antibiotics, there is an urgent and critical need to implement comprehensive antimicrobial stewardship programs (ASPs). These programs are vital for promoting the responsible use of antibiotics, educating healthcare professionals and patients alike, and ultimately mitigating the rise of antimicrobial resistance in order to safeguard public health and ensure effective treatment options for future generations.[12]

Clinical pharmacist role in preventing NCD risks:

Current trends reveal that effectively tackling obesity will be paramount in the coming years as we strive to curtail the alarming rise in associated comorbidities and their financial toll on society. By focusing on conditions such as type 2 diabetes (T2DM), heart disease, stroke, hypertension, dyslipidaemia, and certain cancers, we can actively combat the escalating mortality rates linked to obesity.[17] This issue, recognized as a significant public health crisis worldwide, has intensified over the past three decades, presenting us with a pivotal opportunity for transformative change. Many factors contribute to this challenge which includes sedentary lifestyles, urbanization, and the widespread consumption of calorie-dense processed foods, while also highlighting key areas where we can make a positive impact.[18]

Obesity and overweight status are critical risk factors for mortality, underscoring the need for a comprehensive approach to this issue. It is essential to acknowledge various causes, including the role of certain medications that may contribute to weight gain, which presents both challenges and opportunities for patients and healthcare providers. Clinical pharmacists are well-positioned to play a vital role in managing and supporting patients with obesity as integral members of the healthcare team.[18] Moreover, to tackle the obesity crisis effectively, we must foster collaboration to develop sustainable, long-term strategies focused on both prevention and treatment. Prioritizing obesity prevention as a core component of non-communicable disease control, investing in obesity treatment programs, and creating environments that encourage healthier choices are essential steps toward a healthier future for our populations.[19]

Clinical pharmacist role in promoting public health initiatives:

Pharmacists are essential contributors to public health initiatives, serving as highly accessible and trusted healthcare professionals. Their expertise and close connection to communities position them at the forefront of early disease detection, prevention, and management. With frequent patient interactions—whether during consultations, prescription refills, or follow-ups—pharmacists consistently promote medication adherence, healthy lifestyle choices, and early recognition of health risks.

Beyond dispensing medicines, pharmacists actively prevent the spread of infectious diseases, administer vaccinations, and

identify risk factors for chronic conditions such as diabetes and hypertension. Their role as the first point of contact for many patients makes them a critical line of defense in reducing preventable illnesses and improving chronic disease outcomes.

Pharmacists also strengthen public health through vaccination drives, health education programs, and medication counseling, bridging gaps in healthcare access and equity. In addition, they lead and support public health campaigns by raising awareness about smoking cessation, healthy nutrition, and mental well-being. Through these initiatives, pharmacists not only enhance individual health outcomes but also contribute directly to building healthier communities.[20]

Clinical pharmacist role in Medication therapy management:

Pharmacists play a vital role in medication therapy management (MTM), a valuable service designed to help patients effectively manage their medications and enhance health outcomes. By conducting thorough reviews of all medications a patient is taking, pharmacists assess potential drug interactions and provide tailored advice to ensure proper medication use. This support is particularly crucial for individuals with chronic conditions who are often prescribed multiple medications.

In addition to medication management, pharmacists are equipped to assist patients with chronic disease management by offering guidance on lifestyle modifications, enhancing medication adherence, and teaching self-management skills. For instance, pharmacists can provide demonstrations on the correct use of inhalers for asthma patients or help diabetics monitor their blood sugar levels effectively. This proactive engagement in disease management not only helps prevent complications but also empowers patients to lead healthier lives.

The MTM Pharmacist delivers patient-centered services aimed at optimizing medication therapy, thereby improving clinical, economic, and humanistic outcomes. Their involvement spans a wide range of MTM services, including Comprehensive Medication Reviews, Targeted Interventions, Adherence Monitoring Interventions, Cost-Effective Interventions, and Transitions in Care. These services are adaptable and can be provided through various formats, including telephone calls, remote video consultations (telehealth), or in-person meetings. Medication therapy management (MTM) services are intended to address complex issues of polypharmacy, preventable adverse drug events, medication

adherence, and medication misuse This flexibility ensures that patients receive the support they need to achieve better health outcomes.[20-22]

Clinical pharmacist role in transitional care:

A significant proportion of hospital admissions result from adverse events linked to medications. The current system fails to deliver a reliable and precise method for sharing medication information among healthcare providers during transitions of care (TOC). As a result, care coordination among providers is often fragmented, leading to treatment decisions that are based on outdated and inaccurate information. It is unequivocally established that pharmacists enhance care transitions at critical points, yet the comprehensive benefits of a pharmacist's involvement throughout the entire TOC process remain inadequately defined. There is an urgent necessity for a TOC model led by pharmacists, with clinical pharmacists overseeing patients' medication management across the entire care continuum. This model is particularly effective for high-risk patients who are prescribed multiple chronic medications and has the potential to be replicated, standardized, and implemented on a national scale.[23]

Clinical pharmacist role in ADR monitoring and pharmacovigilance activity

Many individuals depend on medications for managing or treating various diseases, and while these medicines are often effective, it's important to recognize the potential for adverse drug reactions (ADRs) that can lead to serious health issues. Research indicates that ADRs are responsible for nearly 5% of all acute hospital admissions, highlighting the need for systematic monitoring and prompt recognition of symptoms associated with these reactions. Pharmacovigilance (PV) plays a vital role in the detection, assessment, and prevention of ADRs related to therapeutic agents. The adverse effects of these reactions can significantly impact patient health, with recent studies showing a concerning increase in drug-related mortality by up to 2.6-fold. Consequently, the rise in hospital admissions due to ADRs presents a significant challenge to healthcare professionals, regulatory bodies like the WHO, and the pharmaceutical industry. To effectively address this challenge, it's imperative to implement structured adverse drug reaction monitoring programs. This proactive approach not only enhances the identification of ADRs but also improves the overall standard of patient care.[24-

26] Within healthcare systems, pharmacists are essential in developing and maintaining programs for monitoring and reporting ADRs. They have both a professional and ethical responsibility to report any suspected reactions. By engaging in the prevention, detection, documentation, and reporting of ADRs, pharmacists play a crucial role in fostering drug safety and promoting better patient outcomes. [27]

Challenges in integrating clinical Pharmacy services:

There is an urgent need to elevate the awareness of Clinical Pharmacy Services (CPS) and the role of Pharm D professionals in India. It is clear that the general public lacks understanding of the critical contributions that clinical pharmacists make in hospital settings. The regulatory framework must evolve to recognize the essential role of clinical pharmacists at the national level. Furthermore, it is imperative to address the lack of confidence among clinical pharmacists in their interactions with other healthcare professionals; this is a barrier that must be overcome to ensure that primary care providers actively seek their expertise for drug-related queries. To tackle these issues, we need to implement robust training programs under qualified preceptors in appropriate clinical environments, which will empower clinical pharmacists and enhance their professional capabilities. [28,29]

II. CONCLUSION:

In recent years, clinical pharmacy has experienced significant growth in both its scope and professional services. Today, it is widely recognized as an essential part of the multidisciplinary healthcare system. Clinical pharmacists play a crucial role within the healthcare team by enhancing patient care through active collaboration with both physicians and patients. Their specialized expertise in therapeutics and frequent interactions with prescribers uniquely position clinical pharmacists to bridge communication gaps between patients and physicians. This close partnership between clinical pharmacists and clinicians creates a strong foundation for delivering safe, effective, and high-quality patient care.

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