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Review Article

Community Pharmacists and their Role in Non-Communicable Disease (NCD) Management: A Critical Review of Global and Indian Evidence

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ABSTRACT

Background: Non-Communicable Diseases (NCDs) are the leading cause of morbidity and mortality globally, with India facing a rising burden. Community pharmacists, due to their accessibility and trust within communities, are well-positioned to support NCD prevention, early diagnosis, and long-term care. Aim: To critically review global and Indian evidence on the role of community pharmacists in NCD management and provide practical recommendations for their integration into India's primary healthcare system. **Materials and Methods:** This narrative review draws on literature from 2000 to 2025, sourced through databases such as PubMed, Google Scholar, Scopus, and institutional reports. Priority was given to studies from Low- and Middle-Income Countries (LMICs), including India, that evaluated pharmacist-led interventions in NCD care. **Results:** International and Indian studies demonstrate that pharmacist-led interventions improve clinical outcomes in diabetes, hypertension, asthma, and adherence. However, despite policy frameworks like NPCDCS and Ayushman Bharat, pharmacists in India remain underutilized. Training gaps, limited recognition, and weak policy integration hinder their broader involvement. **Conclusion:** Community pharmacists can play a critical role in India's NCD response if empowered through policy support, structured training, digital tools, and formal inclusion in national programs. Their integration into primary care teams could reduce the disease burden and improve long-term health system efficiency.

Keywords: Community pharmacists, Non-communicable diseases, India, Diabetes, Hypertension, NPCDCS, Pharmacy policy, Primary healthcare, Pharmacist training.

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INTRODUCTION

Over 74% of deaths worldwide are now due to Non-Communicable Diseases (NCDs) including cardiovascular disease, diabetes, cancer and chronic respiratory disease (World Health Organization [WHO], 2022), and over 80% of this burden is concentrated in Low- and Middle-Income Countries (LMICs) such as India (Simon & Thomas, 2021). WHO and other agencies recommend the need for an integrated approach to screening and prevention as well as long-term management of NCDs at the primary level (Ministry of Health and Family Welfare [MoHFW], 2022). Almost 60% of deaths in India are now due to Non-Communicable Diseases (NCDs) (Chhabra & Sharma, 2023). But health care systems continue to be driven around the management of acute, infectious diseases (Basak & Sathyanarayana, 2010). In fact, India too has a shortage of physicians, particularly in rural areas, which highlights the need to enhance non-physician healthcare workers' roles, including community pharmacists (Pharmacy Council of India, 2024). Community pharmacists are accessible, trusted, and already involved in care around medication (Zullig, Peterson, & Bosworth, 2013). Pharmacists around the world have participated in blood pressure screening, medication therapy management, counselling on lifestyle changes, and patient education (International Pharmaceutical Federation [FIP], 2023). But in India, the role of pharmacists as medication dispensers is predominant with little recognition of their role in care for NCDs (FIP, 2022).

Using the healthcare workforce in India to address this changing burden of chronic disease will require a change in paradigm (NHS England, 2022). The traditional model is based around a single physician but is unable to accommodate the many millions of patients needing life-long care for hypertension, diabetes, cardiovascular disease and cancer (Centers for Disease Control and Prevention [CDC], 2023). In this situation, there needs to be an evolution of the community pharmacist, which is usually the first contact for patients (Gentilini *et al.*, 2025).

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Pharmacists are embedded in local communities and often have a high degree of contact with patients, many of whom are on long-term treatment (Pharmacy Council of India, 2024). Through their role in providing advice on medicinal products and their effects, and in stimulating adherent behaviour, pharmacists have a unique opportunity to intervene in the NCD care pathway at an early stage (Zullig *et al*., 2013). Pharmacists worldwide have shown to be effective in enhancing treatment outcomes, screening risk factors, and promoting patient self-management in an array of chronic conditions (Pharmacy Council of India, 2024). These strategies are evidence-based, coming from randomized trials and large-scale implementation projects in both high- and middle-income settings (Pharmacy Council of India, 2024; FIP, 2023; Adeyemi *et al*., 2023).

Conversely, India has not formally positioned pharmacists within its own public health framework to address NCDs (FIP, 2022). Though schemes like Ayushman Bharat and NP-NCD focus on aspects of primary care and early intervention, the role of pharmacists is still missing from defined pathways of care or policy documents (NHS England, 2022). The disconnect hampers the ability to “scale up” effective, accessible care for Chronic Disease in the Country (CDC, 2023). Utilizing the pharmacy workforce with adequate training and support in the system would drastically improve India’s ability to offer decentralized and affordable services for NCDs (Gentilini *et al*., 2025).

The present review critically examines the existing international and Indian evidence regarding the duties of community pharmacists in managing NCDs (Da Silva *et al*., 2024). The topic is focused on identifying gaps in national health policy, addressing workforce training issues, and exploring potential program integration opportunities (Zhu *et al*., 2024). This condensed version provides a detailed account of the data and offers practical suggestions to improve the care of individuals with chronic illnesses in India, with the aim of aiding policymakers, researchers, and healthcare planners (FIP, 2022).

AIM AND SCOPE

The objective of this article is to critically evaluate the global and Indian evidence regarding community pharmacists' involvement in NCD care and provide practical policy and educational strategies to make them a part of India's primary healthcare system. We examine a wide range of topics, including regulatory frameworks, public health programs, professional gaps, and digital innovations, while also providing policy recommendations that are informed by data and implementation experience.

METHODOLOGY

This is a narrative review of published literature on community pharmacists’ roles in NCD management. A structured literature search was conducted using PubMed, Google Scholar, and institutional reports. No original human data was collected.

LITERATURE REVIEW

A systematic search was conducted for peer-reviewed studies, government reports, and policy briefs published from 2000 to 2025. Databases included PubMed, Scopus, ResearchGate, and Google Scholar. Keywords included "pharmacist NCD interventions," "community pharmacy India," "NPCDCS," and "Ayushman Bharat." Selection criteria favored studies from LMICs with quantified outcomes in pharmacist-led NCD interventions, supplemented with high-income case studies for benchmarking. Articles without empirical evidence were excluded.

This review is based on multidisciplinary and policy literature between 2000- 2025. The sources which we have referred to include journal articles (peer-reviewed), government reports, policy briefs, reports by national and international pharmacy organisations and grey literature focusing on pharmacy practice and NCD care. The aim was to gather evidence for the roles of community pharmacists in current and future non-communicable disease management, including examining this in India and similar Low- and Middle-Income Countries (LMICs).

A structured literature search was conducted using electronic databases including PubMed, Scopus, Google Scholar, and ResearchGate. Key search terms included: “community pharmacists,” “non-communicable diseases,” “India,” “diabetes,” “hypertension,” “pharmacy interventions,” “primary care,” “Ayushman Bharat,” and “NPCDCS.” Boolean operators were used to refine search results, and filters were applied to include only full-text articles available in English.

Studies were selected based on relevance to the review objectives. These included Randomized Controlled Trials (RCTs), systematic and scoping reviews, qualitative evaluations, implementation reports, and national health program documents. Priority was given to studies assessing outcomes of pharmacist-led interventions in NCD screening, counselling, and disease management. Where Indian data was limited, regional and global studies were reviewed to support contextual generalization. Duplicate articles and opinion pieces without empirical evidence were excluded.

RESULTS

International evidence demonstrates that pharmacist-led interventions improve outcomes in glycemic control, blood pressure, adherence, and asthma management (Gentilini *et al*., 2025; Da Silva *et al*., 2024; Adeyemi *et al*., 2023). In countries like the UK, Canada, and Australia, pharmacists are integrated into primary care (NHS England, 2022; FIP, 2022). Indian studies show promising results, including improved BP and HbA1c levels in pharmacist-led interventions (Simon & Thomas, 2021; Sekar & Gottipati, 2025). Despite inclusion in the Indian Public Health Standards (IPHS) and Ayushman Bharat frameworks, pharmacists remain underutilized in national programs (MoHFW, 2022; Chhabra & Sharma, 2023).

DISCUSSION

Globally, the role of community pharmacists in managing non-communicable diseases is being supported by a growing body of evidence. This is particularly noticeable in India. Pharmacist-led interventions have been effective in improving clinical outcomes, adherence, and reducing the burden on health systems worldwide. Regulatory frameworks, collaborative practice agreements, and reimbursement mechanisms have been instrumental in mainstreaming pharmacist integration into primary care teams in countries with high-income populations, such as the UK, Canada, or Australia (NHS England, 2022; CDC, 2023; FIP, 2022).

Despite being one of the most easily accessible healthcare professionals, India's pharmacists are still mostly responsible for dispensing. Programs like NPCDCS and Ayushman Bharat have attempted to decentralize chronic disease care, but they have not yet made any effort to involve pharmacists in operational guidelines or allocate training resources. These are missed opportunities of early screening, counselling, and chronic medications monitoring at the community level. This deficiency is compounded by ambiguous legislations, minimal facilities for training and development, and low regard of pharmacists as businessmen as opposed to healthcare professionals (Chhabra & Sharma, 2023). Though pharmacists are prepared to offer services, there's no institutional or financial support. Physician resistance and poor interprofessional collaboration are factors that hinder pharmacists from participating in integrated care plans.

The pharmacist population in India is vast and dispersed, providing a flexible workforce for community-based chronic disease interventions through training, policy integration, and digital infrastructure. This benefits the country's pharmacy sector. Extending their involvement could directly enhance disease control outcomes and indirectly lower healthcare expenses by preventing complications and hospital stays (NHS England, 2022; MoHFW, 2021).

A limitation of this review is the scarcity of large-scale Indian studies on pharmacist-led NCD programs. Most evidence comes from small pilot studies or extrapolations from other LMICs (Gentilini *et al.*, 2025; Da Silva *et al.*, 2024; Adeyemi *et al.*, 2023; Sekar & Gottipati, 2025). Future research should focus on multi-state implementation pilots and cost-effectiveness analyses in Indian public and private healthcare settings.

INTERNATIONAL EVIDENCE ON PHARMACIST-LED NCD INTERVENTIONS

A 2025 systematic review by Gentilini *et al.*, analyzed 23 pharmacist-led NCD interventions across LMICs and found statistically significant improvements in HbA1c, blood pressure, and medication adherence (Gentilini *et al.*, 2025). Studies from Nigeria, Malaysia, and Brazil showed that pharmacists delivering structured education and monitoring could reduce HbA1c by 0.5-1.0% over 3-6 months (Da Silva *et al.*, 2024).

In a Nigerian RCT, patients receiving pharmacist care had a 0.75% drop in HbA1c, compared to a 0.15% increase in controls ($p < 0.001$) (Adeyemi *et al.*, 2023). Other trials demonstrated improvements in blood pressure and asthma control. These findings align with high-income countries where pharmacists are already key members of chronic care teams (FIP, 2022).

Economic analyses show pharmacist-led care is often cost-effective or cost-saving by reducing emergency visits and complications (Zhu *et al.*, 2024). Improved adherence, better use of generics, and reduced complications contribute to health system savings.

Pharmacists contribute to health promotion and screening as well. In Europe, pharmacists included in the programs focusing on colorectal cancer awareness and breast cancer screening were associated with a marked increase in participation (Da Silva *et al.*, 2024). Pharmacist-directed patient education in asthma self-management has led to decreased acute exacerbations and emergency visits (Adeyemi *et al.*, 2023). These results have prompted the FIP and WHO to advocate for an increased role of pharmacists in NCD prevention (FIP, 2023).

In addition to the impacts on patient care interventions, pharmacist-led programs have also shown positive effects on health system performance indicators-reducing medication errors, improving patient satisfaction, and ensuring continuity of care.

A few high-income countries have implemented formalized pharmacist practice in multi-disciplinary primary care. In the United Kingdom, pharmacists based in general practice carry out medication reviews, manage long-term conditions, and optimise therapy under collaborative practice agreements within the National Health Service (NHS England, 2022). Comparable models in Canada and Australia have shown that pharmacist interventions improve clinical outcomes and ease the workload of general practitioners (Zhu *et al.*, 2024; NHS England, 2022).

The role of pharmacists in disease prevention is also expanding. In Portugal and Switzerland, pharmacists have been involved in vaccination and cancer screening awareness campaigns, leading to increased participation in previously under-screened groups. In the United States, pharmacy-based hypertension management programs have resulted in cost savings of \$1,200 to \$1,800 per patient per year due to fewer complications and hospitalizations (CDC, 2023).

The commonality among these models is the existence of enabling policies, tailored training, and financial incentives. These are the facilitators needed to deliver extended services by pharmacists in a way that is scalable and that works in harmony with other healthcare professionals. As India faces comparable disease burdens, yet continues to underutilize its pharmacists, these findings highlight missed opportunities to improve NCD care through community pharmacy.

EVIDENCE AND EXPERIENCE IN INDIA

Randomized Trials and Pilot Studies

India is slowly generating local evidence. A 2021 RCT by Simon *et al*., in Tamil Nadu found that pharmacist counselling improved glycemic control, adherence, and treatment satisfaction among type 2 diabetes patients (Simon & Thomas, 2021). An RCT by Sekar & Gottipati in 2025 on hypertensive patients showed that 48.8% of the intervention group became normotensive after five pharmacist-led visits, compared to none in the control group (Sekar & Gottipati, 2025).

Another study found that when control group patients later received the pharmacist-led education, over 70% achieved target BP levels within six months (Sekar & Gottipati, 2025).

POLICY LANDSCAPE IN INDIA

National NCD Programme

India launched the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) in 2010, now restructured as NP-NCD (MoHFW, 2022). It emphasizes population-based screening at sub-centres and PHCs. Pharmacists are listed in Indian Public Health Standards (IPHS) as core members of PHC teams (MoHFW, 2022), yet their role in screening or counselling remains unclear in program documents.

Ayushman Bharat Health and Wellness Centres (HWCs)

Under Ayushman Bharat, 1.5 lakh HWCs were launched to provide expanded NCD services (Chhabra & Sharma, 2023). Pharmacists posted at these HWCs can play roles in counselling, screening referrals, and drug adherence monitoring. However, formal integration into protocols and training modules is lacking (Chhabra & Sharma, 2023).

Pharmacy Practice Regulations (PPR), 2015

The Pharmacy Council of India (PCI) released PPR 2015, requiring pharmacists to maintain patient records and provide counselling (Pharmacy Council of India, 2015). Despite being law, implementation has been poor. Most pharmacists receive no ongoing NCD-specific training and focus only on dispensing.

TRAINING AND COMPETENCY GAPS

Over 60% of Indian community pharmacists have only a Diploma in Pharmacy (D.Pharm), with limited patient-care exposure (Pharmacy Council of India, 2024). A 2025 competency study by Kumar *et al*., proposed a framework of 11 pharmacist roles and 24 competencies for primary care, revealing significant gaps in NCD screening, counselling, and clinical decision-making (Kumar, Singh, & Patel, 2025).

Continuing education is mandated by PPR, but most programs focus on product knowledge rather than chronic disease management. Lack of structured CPD in diabetes, hypertension, and patient communication remains a major challenge (Chhabra & Sharma, 2023).

A national framework of pharmacist competencies has identified several practice gaps in screening, education, and interprofessional care (Kumar *et al*., 2025). These are summarised in Table 1.

ECONOMIC AND PUBLIC HEALTH IMPACT

Globally, pharmacist-led care is cost-effective. A systematic review by Zhu *et al*., in 2024 found that pharmacist involvement in diabetes management improved outcomes at a lower cost compared to usual care (Zhu *et al*., 2024). Over 60% of the cost of healthcare in India is out-of-pocket and is mainly spent on drugs (World Health Organisation [WHO], 2022). Intervention from pharmacists can contribute to a lower degree of waste, increased adherence to medical treatment, as well as fewer hospital admissions (FIP, 2022; FIP, 2023). Besides, pharmacists are well-positioned to address Non-Communicable Disease

Table 1: Competencies of Community Pharmacists for NCD Management.

Domain	Competency Required	Current Gap Identified
Screening	BP measurement, glucose checks	Limited skill, rarely practiced.
Patient counselling	Lifestyle education, adherence guidance	Minimal training exposure.
Clinical decision-making	Referral criteria, risk stratification	Largely missing.
Communication	Patient interaction, motivational interviewing	Underdeveloped.
Record-keeping	Use of digital tools or registers	Not routine, no training.
Interprofessional collaboration	Coordinating with doctors, ASHAs, ANMs	Rarely practiced.

Abbreviations: BP = Blood Pressure; ASHA = Accredited Social Health Activist; ANM = Auxiliary Nurse Midwife.

(NCD) risk factors like smoking, obesity, and poor diet through preventive education (FIP, 2022; FIP, 2023). Expanding their role would not only reduce pressure on doctors but also curb NCD complications, which tend to lead to expensive tertiary-level healthcare requirements (Gentilini *et al*., 2025; FIP, 2022).

EXPANDED BARRIERS TO IMPLEMENTATION

Although pharmacists have significant potential in NCD care, several obstacles limit their ability to contribute effectively. Many pharmacists worry that if they give advice or do basic health checks, people might think they're practicing medicine without the right qualifications since they don't have clinical certifications. On the flip side, doctors might push back against sharing responsibilities seeing expanded pharmacy roles as stepping on their toes. Patients often view pharmacists as just shopkeepers, not healthcare providers. Moreover, unclear regulations, lack of incentives, and weak enforcement of professional standards discourage pharmacists from expanding their service scope. To tackle these issues, we need a plan that works on multiple levels - this means training, teamwork between different healthcare professionals educating the public, and support from policymakers.

One major hurdle is the lack of official acknowledgment and payment systems for additional pharmacist offerings. In contrast to nations with public or insurance-based compensation for services beyond dispensing, pharmacists in India seldom get paid to counsel patients, give lifestyle tips, or keep tabs on chronic conditions. This financial drawback discourages drugstores-private retail shops-from setting aside time or space for non-profit activities even when pharmacists are ready and able to do so.

Infrastructure-related barriers also. Most neighbourhood drugstores lack the tools needed for clinical jobs like checking blood pressure, testing blood sugar, or entering health data into computers. Also, the high number of patients and not enough staff in many Indian retail pharmacies create time limits that make it hard to spend a lot of time with each patient. Without organizational support, many pharmacists struggle to balance commercial responsibilities with patient care.

Educational gaps compound these issues. A significant portion of current pharmacists lack prior training in chronic disease counselling, motivational interviewing, or national treatment protocols. Also, opportunities for Continuing Professional Development (CPD) are limited, in terms of both the ease of access, and the relevance to their practice. Where CPD does exist, it is commonly based on drug knowledge, and not on wider clinical and behavioural competencies required for NCD management.

To address these overlapping issues, a strategic approach at the national level is needed. This would include curriculum reform, state-level adoption of Pharmacy Practice Regulations (2015), and integration into national health programs, ideally conducted in collaboration with physicians and public health stakeholders.

A summary of the key barriers limiting community pharmacists' involvement in NCD care is shown in Figure 1.

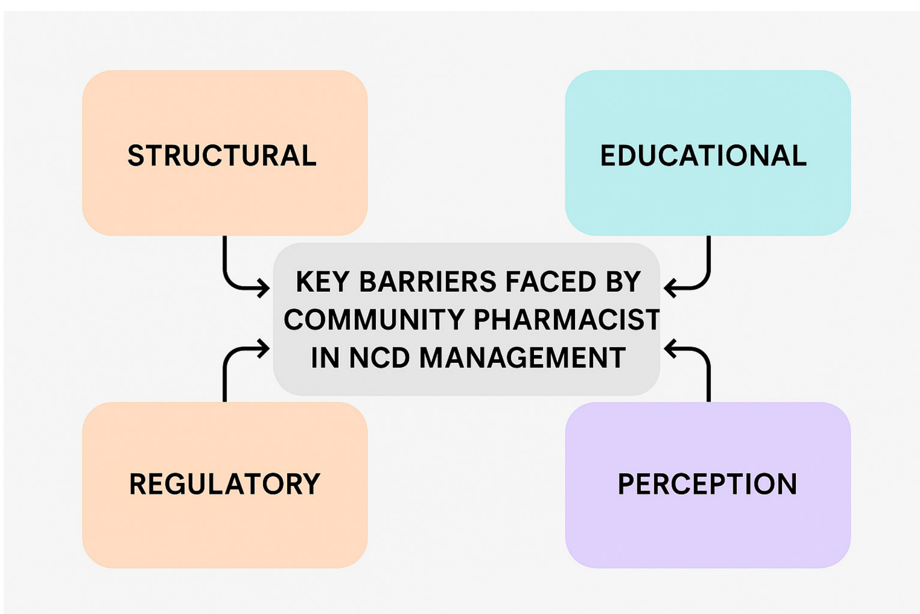

Figure 1: Key Barriers Faced by Community Pharmacists in NCD Management in India. Community pharmacists in India face multiple challenges that limit their role in Non-Communicable Disease (NCD) care. These include regulatory gaps, lack of structured continuing education, absence of reimbursement for non-dispensing services, limited infrastructure, unclear role in public policy, poor public perception, and resistance from other healthcare providers.

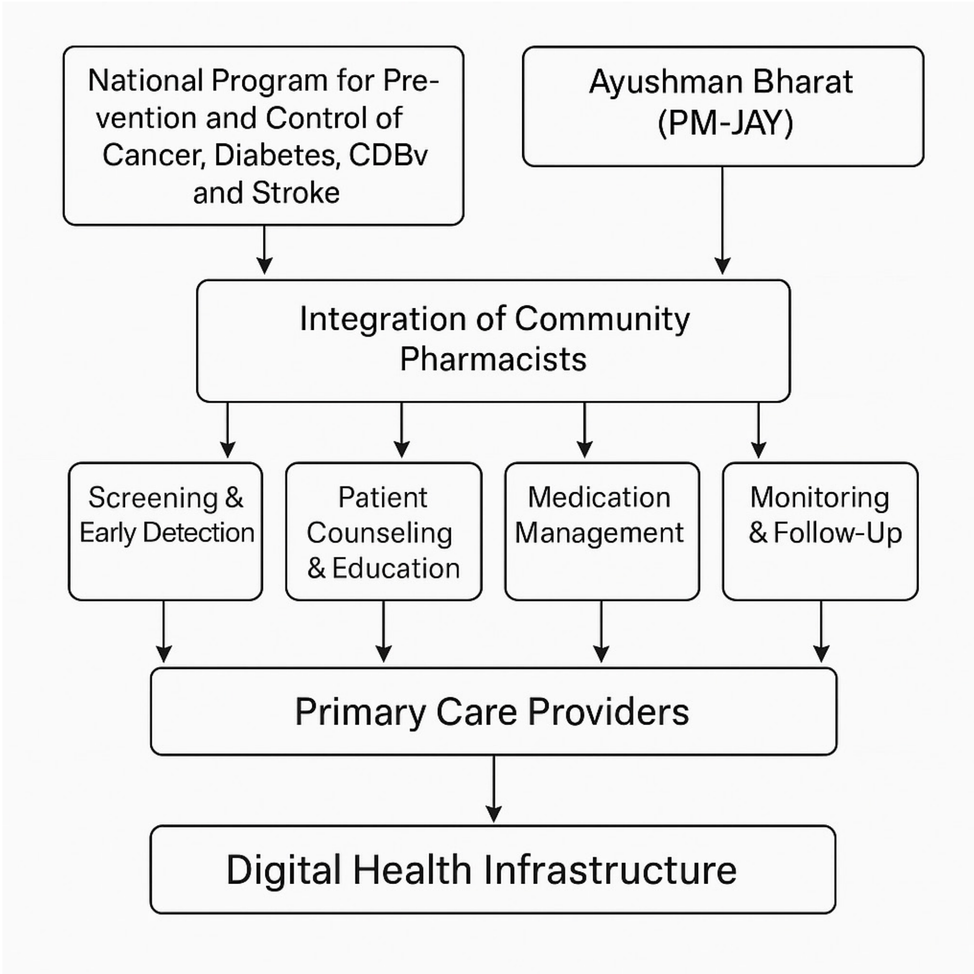

Figure 2: Proposed Model for Integrating Community Pharmacists into India's NCD And Digital Health Ecosystem. Pharmacists act as a bridge between national programs (NP-NCD, PM-JAY) and digital infrastructure, supporting screening, counselling, medication management, and follow-up in collaboration with primary care providers.

This figure summarises structural, regulatory, educational, and perception-related obstacles that hinder community pharmacists from actively participating in chronic disease care pathways in India.

RECOMMENDATIONS FOR POLICY AND PRACTICE

Based on national priorities and international best practices, several strategies can help formalize the role of community pharmacists in NCD management in India:

Integrate pharmacists into national NCD guidelines: Pharmacists should be explicitly included in the operational guidelines of NP-NCD and Ayushman Bharat HWCs, particularly in screening, medication adherence monitoring, and patient counselling workflows.

Mandatory NCD-related continuing education: Refresher courses for pharmacists should include modules on hypertension, diabetes, asthma, cancer screening, and communication skills. Participation in such training can be linked to license renewal under the Pharmacy Practice Regulations (2015).

Introduce public-private service contracts: Private pharmacies may be contracted to provide BP/sugar checks, patient education, and referrals-similar to existing models in tuberculosis and immunization.

Enable pharmacy-based record-keeping: Encourage use of simple NCD registers in pharmacies or digital entry into the national NP-NCD portal or ABHA-linked applications.

Raise public trust in pharmacists: IEC campaigns at community and facility levels should reposition pharmacists as qualified healthcare providers rather than merely retail sellers.

Promote interprofessional collaboration: Conduct joint training sessions for doctors, ASHAs, ANMs, and pharmacists to enhance communication, define roles clearly, and promote collaborative care.

Collectively, these measures can bridge current system gaps and allow pharmacists to contribute meaningfully to chronic disease prevention and control.

PHARMACISTS AND INDIA'S DIGITAL HEALTH ECOSYSTEM

The NDHM, which is now an integral part of the Ayushman Bharat Digital Mission (ABDM), aims to install countrywide integrated digital infrastructure (Ministry of Health and Family Welfare [MoHFW], 2021). That means using unique Health ID numbers (ABHA), electronic health records, and integrated registries (MoHFW, 2021). In this context, while the absence of physicians and diagnostic centres is often acknowledged, community pharmacists remain largely unnoticed.

Crucially important here is the role of pharmacists in recording longitudinal NCD data, given that they typically have greater volumes of patients to deal with and have spent longer studying medications themselves (FIP, 2022). To illustrate, pharmacists have the ability to document BP, glucose readings, and medication adherence during every refill and upload it to ABHA-related patient profiles (FIP, 2022). Timely intervention and risk stratification would be aided by this (Gentilini *et al*., 2025).

Lack of training in digital tools, fear of legal liability, and lack of formal digital reporting systems in pharmacies are obstacles that impede their participation. Including pharmacists in ABDM orientation programs, integrating pharmacy software with the NP-NCD portal, and offering digital reporting could lead to improved coverage as well as care continuity (MoHFW, 2021). Having pharmacists as primary digital health nodes could significantly enhance India's NCD surveillance and management infrastructure (FIP, 2022) (Figure 2).

CONCLUSION

In India, non-communicable diseases are already at an advanced stage. Community pharmacists, once they are trained and integrated, can assist in early diagnosis, patient counselling, and long-term medication management. There is evidence from other LMICs and India that pharmacist-led interventions are effective in improving NCD outcomes and cost-effective (Gentilini *et al*., 2025; FIP, 2022; Da Silva *et al*., 2024).

To achieve this, India must:

- Implement uniform Pharmacy Practice Regulations.
- Impart NCD-focused training to pharmacists.

Pharmacists should be officially included in initiatives like NP-NCD and Ayushman Bharat. India's primary care system and public health outcomes could be improved by prioritizing pharmacists as the primary NCD providers through a policy shift.

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While no specific individuals were directly involved in the preparation of this manuscript, the author also recognizes the indirect influence of healthcare professionals, educators, and policymakers whose ideas, shared through academic and public domains, helped shape the understanding presented in this review.

ABBREVIATIONS

ABHA: Ayushman Bharat Health Account; **ABDM:** Ayushman Bharat Digital Mission; **ANM:** Auxiliary Nurse Midwife; **ASHA:** Accredited Social Health Activist; **BP:** Blood Pressure; **CPD:** Continuing Professional Development; **FIP:** International Pharmaceutical Federation; **HWC:** Health and Wellness Centre; **LMIC:** Low- and Middle-Income Country; **NCD:** Non-Communicable Disease; **NP-NCD:** National Programme for Prevention and Control of Non-Communicable Diseases; **NPCDCS:** National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke; **PCI:** Pharmacy Council of India; **PPR:** Pharmacy Practice Regulations; **RCT:** Randomized Controlled Trial; **WHO:** World Health Organization.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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