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Review Paper

Role Of Pharmacists in Enhancing Medication Adherence in Chronic Disease Patients: A Review

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ABSTRACT

Poor medication adherence remains as one of the most significant barriers to achieving therapeutic goals in the management of chronic diseases. Adherence to a long term therapy in developed countries averages only about 50%, and rates are even lower in the developing countries, which is contributing substantially to preventable morbidity, mortality and healthcare expenditure. Community and clinical pharmacists as the most accessible members of the healthcare team are uniquely positioned to identify, prevent and address non adherence through structured pharmaceutical services and care . The main objective is to review and synthesize the available evidence on the role of community and clinical pharmacists in improving medication adherence among patients with chronic diseases and to summarize the intervention types, measurement approaches, outcomes and barriers reported in the literature available. A narrative review was conducted using PubMed and Google Scholar. Relevant randomized controlled trials, systematic reviews, meta-analyses, and qualitative studies published in English were identified using combinations of the terms “medication adherence,” “pharmacist intervention” and “chronic disease” from the data’s of different authors and different countries were reviewed . Pharmacist led counseling, medication therapy management, adherence packaging, telepharmacy, and interprofessional collaboration were consistently associated with improved medication adherence and also in several studies there were improved clinical outcomes such as blood pressure and glycemic control. Effect sizes varied by intervention type, disease state and the adherence measurement method used. Patient counseling and medication therapy management showed the most consistent benefit. Non-adherence continues to impose a substantial economic burden on healthcare systems and patient. Pharmacists occupy a important and expanding role in improving medication adherence among chronic disease patients. Wider policy recognition, remuneration models, integration into multidisciplinary care teams, and expansion of digital and telepharmacy services are needed to fully realize

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this potential, particularly in low- and middle-income countries

INTRODUCTION

Chronic non-communicable diseases such as hypertension, type 2 diabetes mellitus, dyslipidemia, chronic kidney disease, chronic obstructive pulmonary disease, and psychiatric disorders accounts for the majority of the global morbidity and mortality. Effective management of these conditions typically requires lifelong pharmacotherapy and the benefits of treatment are only realized when patients take their medications largely as prescribed. According to the World Health Organization, adherence to long-term therapy for chronic illness averages approximately 50% in developed countries and in developing countries the rate are even lower¹. The gap between prescribed and actual medication taking behavior is widely regarded as one of the most under recognized contributors to poor disease control among worldwide.

The consequences of poor adherence goes beyond the individual patient. Non-adherence is associated with disease progression, avoidable hospitalizations and premature mortality and it imposes a substantial economic burden on healthcare systems through increased inpatient, outpatient and emergency care costs because pharmacists are typically the most accessible and most frequently visited healthcare professionals for patients on long term therapy and they are uniquely positioned to identify non adherence early and intervene before it results in clinical changes^{5,28}.

The conceptual foundation for this expanded pharmacist role was introduced by Hepler and Strand in 1990² through the philosophy of pharmaceutical care defined as the responsible provision of drug therapy for the purpose of achieving proper outcomes that improve a patient's quality of life. This shift reoriented pharmacy

practice away from a purely product and dispensing centered function toward a patient centered, outcomes oriented one in which the pharmacists actively identify, resolve and prevent drugrelated problems including the problems of medication adherence.

Over the past two decades, a substantial body of evidence has accumulated evaluating the effectiveness of pharmacist-led interventions ranging from simple counseling to structured medication therapy management, adherence oriented packaging and telepharmacy in improving medication-taking behavior across a range of chronic disease conditions. This review aims to synthesize this evidence, describe the principal types of pharmacist led interventions and the tools used to measure their effect and summarize disease-specific outcomes, discuss the economic implications of non-adherence, and outline the barriers that continue to limit the scale-up of pharmacist led adherence services with particular attention to implications for practice in resource limited settings such as India

From Dispensing to Pharmaceutical Care: The Evolving Role of the Pharmacist

Mainly the pharmacists role is centered on the accurate dispensing of medications. The pharmaceutical care movement initiated by Hepler and Strand redefined this role around direct responsibility for a patient's drug-related needs including the prevention and resolution of drug therapy problems such as non-adherence. In parallel, professional bodies worldwide have progressively expanded the scope of community and clinical pharmacy practice to include medication reviews, chronic disease monitoring, and collaborative prescribing arrangements. Despite this the studies continue to find that pharmaceutical care services, including structured adherence support are inconsistently implemented in routine community pharmacy practice with



gaps particularly evident in follow-up, documentation and interprofessional communication^{8,49}. This gap between the stated philosophy of pharmaceutical care and its everyday implementation underscores the continued relevance of reviewing what pharmacist led adherence interventions actually achieve in practice.

Types of Pharmacist-Led Interventions to Improve Medication Adherence

Pharmacist-led adherence interventions can be broadly grouped into several categories, patient counseling and education, medication therapy management, medication synchronization, adherence packaging, telephonic and reminder-based follow-up, telepharmacy and digital health tools, behavioral interventions, and interprofessional collaboration³. A recent systematic review classified interventions across 26 randomized controlled trials into counseling (53.8%), tailored interventions (26.9%), technology based monitoring (3.85%), and multiple/combined interventions (15.4%), of which 69.2% demonstrated a significant positive association with medication adherence⁴.

1. Patient Counseling and Education

Patient counseling and education is face to face counseling which remains as the most frequently studied and most commonly implemented pharmacist led adherence intervention. Counseling typically addresses disease and medication knowledge, correction of misconceptions, side-effect management and practical strategies for incorporating medication taking into daily routines. In a multifactorial pharmacist-led intervention protocol combining face-to-face counseling, patientspecific medication booklets, and a mobile application in patients with type 2 diabetes in the United Arab Emirates, the

intervention group showed significantly greater improvement in composite medication possession ratio at 12 months compared with usual care¹³. Similarly, a collaborative pharmacist-psychiatrist patient education intervention in patients with depression in India produced statistically significant improvements in both medication adherence and health related quality of life compared with usual care¹⁶.

2. Medication Therapy Management (MTM)

Medication therapy management involves a comprehensive structured review of a patients complete medication regimen to identify and resolve drug-related problems including medication adherence barriers. In an analysis of 59 studies comprising over 28,000 patients medication therapy management was associated with the greatest improvement in adherence among all intervention types examined (odds ratio 2.89), followed by telephonic follow-up (odds ratio 2.41) and patient counseling (odds ratio 2.18), with the largest benefit observed in hypertension and diabetes groups⁶.

3. Medication Synchronization and Adherence Packaging

Clarifying complex regimens through medication synchronization, unit-dose or blister packaging, and pill organizers reduces the cognitive and logistical burden of daily medication-taking, particularly in patients with polypharmacy. Older adults prescribed multiple medications commonly experience adherence difficulties related to regimen complexity and pilot studies of community pharmacy delivered, theory guided interventions that combine adherence-barrier identification with tailored solutions including packaging and reminder aids have demonstrated feasibility for improving adherence in this population^{18,37}.



4. Telephonic Follow up and Reminder Based Interventions

Structured telephone follow up calls and reminder systems including text-message and application based reminders allow pharmacists to actively identify emerging non adherence between clinic or pharmacy visits. In a randomized controlled trial among Vietnamese patients with asthma, pharmacist led interventions addressing individualized non adherence reasons, disease and device education and reminder strategies produced significant improvements in adherence relative to usual care⁵².

5. Telepharmacy and Digital Health Tools

Telepharmacy mainly include remote prescription verification, virtual counseling and digital adherence monitoring has expanded rapidly particularly for patients in geographically underserved areas. Retrospective analysis of a multicomponent digital therapeutic mobile application incorporating gamification, dosage reminders, incentives, and educational content found sustained improvements in adherence rates among adults with chronic conditions over both three and sixmonth follow up periods⁴⁰. Similarly, a telepharmacy based adherence service delivered through a mobile application platform showed a positive association between telepharmacy use and medication adherence, measured using the Morisky Medication Adherence Scale, among chronic disease patients^{41,44}. While digital tools offer adaptability their integration into routine pharmacy workflows continues to be constrained by regulatory uncertainty and reimbursement barriers^{38,39}.

6 .Tailored and Behavioral Theory Based Interventions

Interventions that identify each patient's specific, individualized barriers to adherence rather than

applying a uniform counseling script appear to produce more consistent benefit than generic education alone. A cluster randomized controlled trial in Indonesia targeted only patients with type 2 diabetes who reported non-adherence to antihypertensive therapy, delivering interventions tailored to each patient's specific adherence barriers rather than a standardized message¹⁵. Likewise, a behavioral-theory-based New Medicine Service toolkit developed for community pharmacists in Türkiye was designed around the Theoretical Domains Framework to systematically identify and address individual reasons for non-adherence to newly prescribed cardiometabolic medications⁴³.

7. Interprofessional Collaboration

Pharmacists increasingly work alongside physicians, community health workers, and other healthcare professionals to support adherence. A systematic review of interprofessional collaboration between pharmacists and community health workers found that combined interventions could extend the reach of adherence support, particularly in resource-limited and rural settings⁴⁶. Primary care physicians themselves have identified closer collaboration with pharmacists as a desirable strategy for addressing the adherence challenges they encounter in everyday practice³¹.

Tools Used to Measure Medication Adherence

Accurate measurement of adherence is essential to evaluating the effectiveness of pharmacist-led interventions, yet no single method is considered as a gold standard. Adherence measurement approaches are broadly classified as subjective (self-report questionnaires) or objective (pharmacy refill data, pill counts, electronic monitoring). The 8-item Morisky Medication Adherence Scale (MMAS-8) remains among the



most widely used self-report tools in pharmacist-led adherence research; a systematic review and meta-analysis of 28 validation studies found acceptable internal consistency and reproducibility in certain disease groups such as type 2 diabetes, although criterion validity at the standard cut-off score was found to be limited^{20,21}. Objective measures such as the Medication Possession Ratio (MPR) and Proportion of Days Covered (PDC), derived from pharmacy dispensing records, are less susceptible to social-desirability bias than self-report tools but require access to reliable refill data, which may not be available in all practice settings²². Many of the

studies reviewed here used self-reported questionnaires, which likely overestimate true adherence rates²³; findings should therefore be interpreted with this limitation in mind.

Disease-Wise Summary of Pharmacist-Led Adherence Evidence

Table 1 summarizes representative randomized controlled trials and pilot studies evaluating pharmacist-led adherence interventions across major chronic disease categories, illustrating the range of intervention types, settings, and outcomes reported in the literature.

Table 1. Representative randomized controlled trials and pilot studies of pharmacist-led interventions on medication adherence, by disease category.

Disease/Condition	Study (Setting)	Intervention Type	Key Adherence/Clinical Outcome	Ref.
Hypertension	PHARM-ADHERE (Belgium)	First-prescription counseling + followup consultation	Higher PDC-based adherence (80.0% vs 73.3%) and lower discontinuation vs usual care	10
Hypertension	HAPPY Trial (Australia)	Structured pharmacy-workflow adherence package	Multi-centre RCT testing an integrated adherence/persistence support package	11
Hypertension	Zunyi, China	Community pharmacist monitoring and counseling	Improved drug therapy adherence and blood pressure control	12
Type 2 Diabetes	MPIP (UAE)	MTM + counseling + medication booklet + mobile app	Significantly higher composite medication possession ratio at 12 months	13
Type 2 Diabetes	PICC Program (Malaysia)	Group-based structured education	Improved adherence, diabetes knowledge, and HbA1c targeted outcomes	14
T2DM + Hypertension	Cluster RCT (Indonesia)	Tailored, barrierspecific counseling	Protocol targeting only patients identified as antihypertensive-nonadherent	15

Diabetes	Community pharmacy (Pakistan)	Pharmacist-led counseling and glycemic monitoring	Improved adherence (MMAS) and glycemic control (FBG/RBG) vs control	51
COPD	Vietnam	Clinical pharmacist counseling and inhaler technique review	Significant improvement in medication adherence vs usual care	50
Asthma	Vietnam	Individualized counseling addressing specific non-adherence reasons	Significant improvement in adherence at 1-month follow-up	52
Depression	India	Pharmacist–psychiatrist collaborative patient education	Significant improvement in adherence and healthrelated quality of life	16
Depression	Japan	CBT-based pharmacist counseling with	Non-randomized controlled study of adherence-focused behavioral support	17
		telephone monitoring		
Chronic Kidney Disease	Scoping review (multi-country)	Medication reconciliation, reviews, counseling, education	Potential positive impact on adherence and outcomes; evidence base still developing	7
Polypharmacy/Older Adults	S-MAP pilot (UK)	Theory-guided, tailored barrierbased solutions	Feasibility demonstrated; adherence barriers identified in 98% of patients	18

Economic Impact of Non-Adherence and of Pharmacist-Led Interventions

Medication non-adherence imposes a substantial and consistent economic burden across chronic disease populations. A systematic review of 79 original cost studies found that the annual, diseasespecific economic cost of non-adherence per patient varied widely depending on the condition and cost components measured, with lower adherence generally associated with higher total healthcare costs, driven primarily by increased hospitalization, emergency department, and outpatient utilization^{24,26}. Disease-modifying therapy adherence in multiple sclerosis, for example, has been associated with meaningfully lower total medical costs, hospitalization costs,

and emergency room costs compared with non-adherence²⁷.

Because of this economic burden, there is growing interest in the cost-effectiveness of pharmacistled adherence interventions themselves. An overview of systematic reviews evaluating the economic evaluation of adherence-improving interventions found that, while methodological heterogeneity limits direct comparison across studies, several categories of intervention including pharmacistled counseling and medication therapy management — have demonstrated favorable or cost-neutral economic profiles when downstream reductions in hospitalization and disease complications are accounted for²⁵. This economic case strengthens the argument for formal

reimbursement and policy recognition of pharmacist-led adherence services within national health systems.

BARRIERS AND CHALLENGES

Despite consistent evidence of benefit, several barriers continue to limit the routine implementation and reach of pharmacist-led adherence interventions.

Patient-related barriers: Qualitative research consistently identifies forgetfulness, low health literacy, side-effect concerns, cultural beliefs about medicines, polypharmacy-related regimen complexity, and financial constraints as recurring patient-level barriers to adherence^{29,30,34,35,47}. A qualitative study among patients with uncontrolled diabetes identified the use of alternative remedies, time pressure, poor relationships with prescribers, and self-alteration of dosing as additional contributing factors³⁶.

Provider- and system-related barriers: General practitioners themselves report time constraints, fragmented interprofessional communication, and inadequate information-technology systems as obstacles to supporting patient adherence, and have specifically called for closer collaboration with pharmacists as a potential solution³¹. Within pharmacy practice itself, limited consultation time, inadequate remuneration for cognitive services, and lack of formal recognition of the pharmacist's clinical role remain frequently cited constraints^{32,48} on the delivery of adherence support.

Barriers specific to older adults and different morbidities: Older patients managing multiple chronic conditions and complex regimens require additional layers of support caregiver involvement, specialized packaging, and visual or auditory reminders and geographic distance from pharmacy services has also been identified as a barrier in this population³⁷

Barriers to technology-based interventions: The scale-up of telepharmacy and mobile-health adherence tools is constrained by the absence of clear regulatory pathways for digital therapeutics, the need for robust clinical validation, and reimbursement obstacles from insurers, in addition to unequal digital access among patient populations^{38,39}

Barriers in low- and middle-income settings: In India, despite a substantial and growing burden of non-communicable disease, a first systematic review of adherence-improving interventions found that most existing evidence was of mixed methodological quality, with patient education delivered by community health workers and pharmacists identified as a promising but under-evaluated strategy requiring further high-quality trials and integration into wider health policy⁹

Several directions appear promising for strengthening the pharmacist's role in medication adherence going forward. First, wider integration of artificial-intelligence-supported digital health tools and telepharmacy platforms into routine pharmacy workflows could extend adherence support beyond the constraints of in-person consultation time, provided regulatory and reimbursement frameworks evolve accordingly^{42,45}. Second, formal recognition and remuneration of pharmacist-delivered cognitive services — including structured medication reviews and tailored adherence counseling — within national health insurance and reimbursement schemes would help address the provider-level barriers identified above. Third, expansion of interprofessional models that combine pharmacists with community health workers and primary care physicians appears particularly well suited to resource-limited and rural settings, where access to specialist care is constrained⁴⁶. Finally, there remains a clear need for further high-quality, adequately powered randomized controlled trials in low- and middle-



income countries such as India, where the burden of chronic disease is rising rapidly but the evidence base for pharmacist-led adherence interventions remains comparatively underdeveloped.

CONCLUSION

Medication non-adherence remains a pervasive and costly obstacle to effective chronic disease management worldwide. The evidence reviewed here indicates that community and clinical pharmacists, through counseling, medication therapy management, adherence packaging, telepharmacy, tailored behavioral interventions, and interprofessional collaboration, can meaningfully improve medication-taking behavior and, in many cases, downstream clinical outcomes. The magnitude of benefit varies by intervention type and disease state, and is most consistently demonstrated for structured, tailored interventions rather than generic education alone. Realizing the full potential of pharmacist-led adherence support will require sustained policy investment in reimbursement, workforce capacity, and digital infrastructure, together with continued high-quality research, particularly in understudied, resource-limited settings.

REFERENCES

1. Sabaté E, editor. Adherence to long-term therapies: evidence for action. Geneva: World Health Organization; 2003.
2. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. *Am J Hosp Pharm.* 1990;47(3):533–543.
3. Nieuwlaat R, Wilczynski N, Navarro T, Hobson N, Jeffery R, Keenanasseril A, et al. Interventions for enhancing medication adherence. *Cochrane Database Syst Rev.* 2014;(11):CD000011.
4. Effectiveness of pharmacist-led intervention on medication adherence in chronic diseases: a systematic review of randomized controlled trials. *Patient Prefer Adherence.* 2025.
5. Mandava J. Impact of community pharmacist interventions on medication adherence in chronic disease patients. *J Community Pharm Pract.* 2026;6(1):20–30.
6. Clinical impact of pharmacist-led interventions on medication safety, adherence, and chronic disease management: a systematic review. *Vasc Endovascular Rev.* 2025;8(11 Suppl):248–254.
7. Pharmacist-led interventions for medication adherence in patients with chronic kidney disease: a scoping review. *Pharmacy (Basel).* 2023;11(6):185.
8. Improving medication adherence in the community: a purposive umbrella review of effective patient-directed interventions that are readily implementable in the United Kingdom National Health Service. 2023.
9. Tolley A, Hassan R, Sanghera R, Grewal K, Kong R, Sodhi B, et al. Interventions to promote medication adherence for chronic diseases in India: a systematic review. *Front Public Health.* 2023;11:1194919.
10. Community pharmacist intervention to enhance adherence in patients initiating cardiovascular medication: the PHARM-ADHERE randomized controlled trial. *Eur Heart J.* 2025;46(Suppl 1).
11. Evaluation of a community pharmacy-based intervention for improving patient adherence to antihypertensives: a randomised controlled trial (HAPPY trial). Trial registration: 1. ACTRN12609000705280.
12. Effects of pharmacist intervention on community control of hypertension: a randomized controlled trial in Zunyi, China.
13. The effects of a multifactorial pharmacist-led intervention protocol on medication optimisation and adherence among patients



- with type 2 diabetes: a randomised controlled trial.
14. Effectiveness of a pharmacist-led, community group-based education programme in enhancing diabetes management: a multicentre randomised controlled trial (PICC Program).
 15. Targeted and tailored pharmacist-led intervention to improve adherence to antihypertensive drugs among patients with type 2 diabetes in Indonesia: study protocol of a cluster randomised controlled trial. *BMJ Open*.
 16. Randomized controlled trial to assess medication adherence and health-related quality of life through a collaborative pharmacist-psychiatrist approach to patient education in patients with depression in India.
 17. A non-randomized, controlled, interventional study to investigate the effects of community pharmacists' cognitive behavioral therapy-based interventions on medication adherence and relevant indicators in patients with depression. *BMC Psychiatry*. 2023.
 18. A non-randomised pilot study of the Solutions for Medication Adherence Problems (SMAP) intervention in community pharmacies to support older adults adhere to multiple medications.
 19. Visualisation of hypertension: a non-randomised pilot study to explore the feasibility of a community pharmacy-based intervention to support medication adherence (Hi-BP).
 20. Accuracy of a screening tool for medication adherence: a systematic review and metaanalysis of the Morisky Medication Adherence Scale-8. *PLoS One*. 2017;12(11):e0187139.
 21. Medication adherence across diseases using the 8-item Morisky Medication Adherence Scale (MMAS-8): a systematic review with narrative synthesis. *Cureus*. 2026.
 22. A systematic review of medication adherence tools and measures.
 23. Development of a self-administered questionnaire to identify levers and barriers to adherence to medication regimens for chronic disease: the QUILAM project.
 24. Economic impact of medication non-adherence by disease groups: a systematic review. *BMJ Open*. 2018;8(1):e016982.
 25. Economic evaluation of interventions to improve medication adherence among patients with chronic diseases: an overview of systematic reviews. *Expert Rev Pharmacoecon Outcomes Res*. 2023;23(2):153–179.

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