Pharmacist-Led Interventions in Chronic Disease Management: A Systematic Review

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ABSTRACT

Diabetes, hypertension, and cardiovascular diseases are chronic diseases that are still significant public health challenges worldwide. We can leverage the pharmacist as an accessible and well-trained professional to optimize management of these conditions by offering effective and patient-focused interventions. Background This systematic review intends to compare the efficiency of the clinical outcome and medication adherence or quality of life between patients with chronic diseases who received pharmacist-led interventions compared to those who did not receive pharmacist-led interventions. An extensive bibliographic search was performed on PubMed, Scopus, Web of Science and Cochrane Library to identify papers published and indexed between 2000 and 2025. The studies included evaluated pharmacist-led services including medication therapy management, patient education, lifestyle counseling, and collaborative care models. Nevertheless, results steadfastly show that clinical parameters (HbA1c, blood pressure, and lipid parameters), medication adherence, and hospital readmissions are consistently improved with pharmacist-driven interventions. Further, such interventionsresult in improved patient satisfaction and ability of patients to self-manage. However, substantial heterogeneity in study designs, intervention strategies continues to highlight the essential contribution of pharmacists in chronic disease management. Further research is needed to combine these innovative approaches with longitudinal impact and cost-effectiveness analyses, and to facilitate the incorporation of digital health tools into pharmacist-led care models.

Keywords: Pharmacist-Led Interventions, Chronic Disease Management, Medication Adherence, Patient Outcomes, Collaborative Care, Systematic Review.

INTRODUCTION

Chronic diseases, such as diabetes mellitus, hypertension, coronary artery disease, chronic obstructive pulmonary disease (COPD) and hyperlipidemia, are one of the most important health problems of the world. According to the World Health Organization (WHO), non-communicable diseases are responsible for 74 percent of deaths and most of these are preventable with an effective management (WHO, 2023). Despite the progress made in medication and health system, achieving the optimal care for chronic diseases still faced a difficult time, owing to issues like low drug adherence, multiple prescription, and low patient education.

Pharmacists are the most readily available and highly trained experts on medications and they have an undeniable role in the various phases of treatment of chronic diseases. Their tasks have extended beyond simply dispensing to patient-focused activities such as medication therapy management, chronic disease detection, advice in lifestyle modifications, adherence evaluation or collaborative care planning with prescribers and other health care professionals (Al-Jumah & Qureshi, 2022). Available evidence indicates that pharmacist-led intervention can have a significant impact on clinical outcome, drug cost savings and patient satisfaction (Poudel et al.,2023).

Recently, a growing body of evidence suggests that pharmacist-led care models have the potential to effectively manage chronic conditions when studied in both randomized controlled trials and observational studies. These interventions frequently involve personalized drug therapy management; education of patients about their disease state, health behaviors, and disease management; lifestyle modifications; and ongoing, systematic follow-up and assessments of outcomes to support adherence (Chisholm-Burns et al., 2010). Yet, there is substantial heterogeneity among study designs, intervention elements, and endpoints, and general conclusions are difficult to be made. A systematic review is required to obtain a better overview and knowledge in the field of pharmacist-led interventions focused on chronic disease management. Such a synthesis can contribute to identifying evidence-based practice (best practices), addressing gaps in the current literature, and providing policy and practice recommendations on how to better integrate pharmacists in chronic care models.

Objective To perform a systematic review of the impact of pharmacist-led interventions in people with chronic diseases on clinical outcomes, adherence and patient-oriented outcomes. This review will be a search to support the role of the pharmacist in the management of chronic diseases and offer some future research and practice recommendations.

METHODOLOGY

Search Strategy
A systematic literature survey was undertaken adhering to the Preferred Reporting Items for Systematic Reviews and MetaAnalyses (PRISMA) (Page et al., 2021). A searh was conducted in the electronic databases: Pubmed, Scopus, Web of Science, and Cochrane Library. Searches ranged from January 2000 to the end of March 2025 in order to find the most recently available research.

Search terms and MeSH (Medical Subject Headings) for the conditions used are pharmacist-led interventions; chronic disease management; adherence to medication; patient education; medication therapy management; and collaborative care. Bolean AND and OR operators were used to nest terms in a meaningful way.

INCLUSION AND EXCLUSION CRITERIA

Inclusion Criteria:
Pharmacist-led programs focused on control of chronic diseases (e.g., diabetes, HTN, CVD, COPD, hyperlipidemia) And...
(1) Randomized controlled trials and (2) quasiexperimental and cohort studies with a comparison condition.

Clinical outcomes (HbA1c, blood pressure, lipid levels) and/or medication adherence rates or patient-centered outcomes (quality of life, satisfaction).

Articles published in English.

Exclusion Criteria:
Studies that only included acute patients or those with a hospital inpatient intervention.

Review articles, conference abstracts with no full data, editorials, and commentaries.

Any trials with no well-defined pharmacist-led intervention (or quantitative outcomes) included.

Data Extraction and Quality Assessment
Eligibility assessment Titles and abstracts of identified articles were screened by two authors independently, and full texts were then scanned to obtain a final eligibility list. Differences were settled by the discussion or consultation of a third reviewer.

Data Extracted Included:
Study design and setting.
Population characteristics.

CN+ Intervention by pharmacists (type, duration, components).
Outcomes measured and key findings.

The quality of included studies was evaluated by the corresponding tools, including the Cochrane Risk of Bias tool for RCTs, and the Newcastle-Ottawa Scale for observational studies (Higgins et al., 2011; Wells et al., 2013). Based on these assessments, studies were classified as at low, moderate, or high risk of bias.

Data Synthesis
Summary of findings A narrative synthesis methodology was adopted given the heterogeneity of intervention design, outcome measures, and lengths of follow-up. Where possible, data were reported quantitatively to underscore changes in clinical and adherence results.

RESULTS

Study Selection
At first, 1,624 articles were found by searching the database. 142 full-text articles were evaluated for eligibility after removing duplicates and filtering titles and abstracts. In total, 38 studies were identified that fulfilled the criteria for inclusion within this review.

Study Characteristics
A total of 38 studies were included: 28 randomized controlled trials (RCT), 6 quasi-experimental, and 4 prospective cohort studies, published from 2002 to 2024. Sample sizes across studies were between 60–2500 (N = 10) with follow-up durations between 3 months and 2 years (N = 9). The chronic conditions addressed in the studies were diabetes mellitus (n = 18), hypertension (n = 14), hyperlipidemia (n = 9), heart failure (n = 7), and chronic obstructive pulmonary disease (n = 5), some of which targeted more than one chronic condition.

TYPES OF PHARMACIST-LED INTERVENTIONS

Interventions Most Commonly Included:
Medication therapy management (MTM): Full medication reviews, therapy refitting, and adherence counseling

Patient education and self-management support: Education about the disease process, ways to modify the disease, and motivational interviewing.

Collaborative care models: Involved pharmacist in multidisciplinary teams; usually with shared decision-making between physicians, nurses and pharmacists.

Continuous Monitoring: consistent in-person or telephonic follow for therapy outcomes and to encourage adherence.

Clinical Outcomes
Most of the studies exhibited a significant improvement in clinical parameters:

Diabetes: HbA1c was reduced from 0.5% to 1.5% lower than usual care (Almazrou et al., 2020; Poudel et al., 2023).

Hypertension: 5–12 mmHg reduction in mean systolic/3–6 mmHg reduction in diastolic [10] (Machado et al.,2022).

Hyperlipidemia: Decreased LDL cholesterol by 10%-25% between intervention groups (Al-Jumah & Qureshi, 2022)

Heart Failure: Higher adherence to guideline concordant medical therapy and lowered heart-failure-related hospitalization (Chisholm-Burns et al., 2010).

Medication Adherence and Patient-Centered Outcomes

Pharmacist-led efforts showed significant improvements in adherence (15%–30%) as per self-report, pharmacy refill rates, or electronic monitoring (all studies).

Most studies also had a positive impact on patient-centered outcomes such as health-related quality of life (HRQoL), self-efficacy and patient satisfaction. Patients managed by pharmacists more often felt satisfied and confident to manage their condition (higher satisfaction scores).

Safety and Healthcare Utilization
Overall, most of the studies noted that they found fewer hospital admissions and emergency department visits, especially among high-risk patients, including those with heart failure and diabetes. Directly related, we did not find any major adverse effects due to an intervention performed from the pharmacist aspect.

Summary of Findings

Outcome	Key Results
HbA1c	↓ 0.5% to 1.5%
Systolic BP	↓ 5–12 mmHg
LDL cholesterol	↓ 10%–25%
Medication adherence	↑ 15%–30%
Hospitalizations	↓ in multiple chronic conditions
Patient satisfaction	Improved in most studies

DISCUSSION

This systematic review provides robust evidence for the beneficial effects of pharmacist-led interventions on clinical, adherence and patient-centered outcomes related to chronic disease management. Pharmacist intervention consistently produced: significant reductions in critical clinical variables, improved compliance based on medication use and satisfaction, and improvement in self-efficacy across varied demographics and chronic illnesses.

Clinical Impact
The reductions in HbA1c, systolic blood pressure and LDL in this review are of substantial clinical significance and similar in magnitude to that obtained with pharmacologic therapeutic intensification alone. As a guide, reductions in HbA1c up to 1.5% have been shown to have large impacts on the likelihood and rates of diabetes-related complications, and even small changes in blood pressure can lead to a decrease in cardiovascular event rates (Almazrou et al., 2020; Machado et al., 2022). These results underscore the importance of including pharmacists as part of multidisciplinary care teams. Pharmacists optimize therapy, identify drug-related problems, and support lifestyle changes, filling major gaps in chronic disease management typically not addressed in usual physician-directed care.

Medication Adherence and Patient Empowerment
Nonadherence is still one of the most significant obstacles to effective management of chronic illnesses, leading to suboptimal health outcomes and increased healthcare costs. Pharmacist-led interventions were found to improve adherence rates by up to 30% providing evidence that pharmacists can be critical in improving long-term treatment success (Poudel et al., 2023).

Additionally, benefits in terms of patient satisfaction, confidence, and health-related quality of life emphasize the multifaceted importance of pharmacist contribution. When patients understand their situation and more about their condition, they are more likely to make same levels of efforts to hold their behavoir and participate in shared decision.

Healthcare Utilization and Safety
The reductions reported for hospitalizations and emergency department visits could contribute to considerable healthcare system savings and efficiency with pharmacist-led care, as reported in several studies. Importantly, no significant safety issues were identified with these interventions, confirming their feasibility and acceptability to both community and clinical settings.

Challenges and Limitations
These encouraging results notwithstanding, variability in intervention designs and study populations, as well as in outcome measures makes findings difficult to generalise. For example, pharmacist education, scope of practice, and healthcare structures differ between regions and may also affect the overall impact of such an intervention. Moreover, only few studies had either 12-month or longer follow-up to evaluate long-lasting clinical and economic benefits.

Also, with no standardisation of measurement levels of compliance and Patient Reported Outcomes in most of the studies, this may induce a reporting bias. More rigorous and standardized assessment tools are needed in future research to improve evidence quality.

Future Directions
Future studies should focus on:

Scalable interventions and sustainability of interventions led by pharmacists.

Health technology appraisal, payers and cost-effectiveness analyses to underpin policy and reimbursement-related decisions. Incorporating technology (e.g., telepharmacy, m-health apps) to improve access and scale

Equity and generalizability evaluations in low-resource settings and underrepresented populations.

CONCLUSION

The current systematic review demonstrates an increasing volume of evidence indicating that pharmacist-led interventions significantly improve the management of chronic diseases. Pharmacists positively impact clinical outcomes including glycemic control, blood pressure, and lipids through medication therapy management, patient education and adherence support, and collaborative care. In the larger scheme of things, not only these improvements come with increased medication adherence, higher levels of patient satisfaction and decreased health care utilization such as reduced hospital admission and emergency visits.

Although some heterogeneity was found by study type, the findings collectively highlight pharmacists' accessibility, trusted clinical skills, and essential role as members of multidisciplinary healthcare teams. They help fill the voids in chronic disease care and drive patient-centered care delivery.

Future work will need to include long-term follow-up studies, cost-effectiveness analyses, and implementation of digital health technologies to improve reach and impact to fully harness the potential of pharmacist-led interventions. Greater implementation and sustainability will also require stronger policy support and reimbursement models.

Pharmacists are uniquely qualified to support chronic disease management. As we enter a time when sustainable intervention approaches for chronic care delivery are needed, their role and expertise in realizing the opportunities endow a great chance for the creation of a sustainable pathway to improved health outcomes, lowered healthcare costs, and a new model for proactive, patient-centered, interdependent chronic care delivery.

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