REVIEW ARTICLE

Role of Pharmacists in Medication Therapy Management: Improving Adherence, Reducing Drug-Related Problems, and Enhancing Quality of Life

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ABSTRACT

Medication Therapy Management (MTM) is a structured, patient-centered healthcare service aimed at optimizing medication use and improving therapeutic outcomes. Pharmacists play a pivotal role in delivering MTM through comprehensive medication reviews, patient education, identification and resolution of drug-related problems (DRPs), and collaboration with other healthcare professionals. Medication non-adherence and DRPs are major contributors to treatment failure, disease progression, increased hospitalizations, and healthcare costs globally. Evidence increasingly demonstrates that pharmacist-led MTM interventions significantly improve medication adherence, reduce preventable DRPs, and enhance health-related quality of life (HRQoL), particularly among patients with chronic diseases and polypharmacy. This review synthesizes current evidence on the role of pharmacists in MTM, focusing on adherence improvement, DRP reduction, and quality-of-life enhancement. A structured literature search was conducted using multiple databases, and findings were synthesized following a PRISMA-style approach. While strong evidence supports the clinical value of MTM, gaps remain regarding long-term outcomes, standardized assessment tools, and implementation across diverse healthcare settings.

KEYWORDS: Medication Therapy Management; Pharmacists; Medication Adherence; Drug-Related Problems; Quality of Life; Pharmaceutical Care.

INTRODUCTION

Medications constitute one of the most effective and widely used interventions in modern healthcare; however, their benefits are often compromised by inappropriate use, medication non-adherence, and drug-related problems (DRPs). The World Health Organization has identified medication non-adherence as a major public health concern, estimating that approximately 50% of patients with chronic diseases do not take their medications as prescribed, leading to poor disease control and increased mortality (1). Non-adherence contributes significantly to avoidable hospital admissions and healthcare expenditures, with estimates suggesting that medication non-adherence costs healthcare systems billions of dollars annually worldwide (2).

Drug-related problems, defined as events or circumstances involving drug therapy that interfere with desired health outcomes, further exacerbate these challenges (3). Common DRPs include adverse drug reactions, drug-drug interactions, inappropriate drug selection, incorrect dosing, and therapeutic duplication. These problems are particularly prevalent among elderly patients, individuals with multiple chronic conditions, and those exposed to polypharmacy. Studies indicate that a substantial proportion of hospital admissions are medication-related and potentially preventable through improved medication management (4).

Historically, pharmacists were primarily responsible for dispensing medications. Over time, the profession has evolved toward a more patient-centered model of care known as pharmaceutical care, which emphasizes the pharmacist's responsibility for achieving optimal therapeutic outcomes (6). Medication Therapy Management emerged as a formalized framework within pharmaceutical care, designed to ensure that

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medications are appropriate, effective, safe, and used correctly by patients (6). MTM services typically include comprehensive medication reviews, medication reconciliation, patient counseling, identification and resolution of DRPs, adherence monitoring, and coordination with prescribers and other healthcare professionals.

Pharmacists are uniquely positioned to deliver MTM services due to their extensive pharmacotherapeutic knowledge and frequent patient interactions across healthcare settings. Community pharmacists, in particular, often represent the most accessible healthcare professionals, enabling early identification of medication-related issues and continuous adherence support. Hospital and ambulatory care pharmacists contribute by optimizing medication regimens during transitions of care, a period known to be associated with high medication error risk (7,8).

Evidence increasingly supports the role of pharmacists in improving medication adherence through educational, behavioral, and motivational interventions. Pharmacist-led MTM programs have demonstrated improvements in adherence among patients with diabetes, hypertension, cardiovascular disease, asthma, and mental health disorders (9). In addition to improving adherence, MTM services have been shown to reduce DRPs, decrease hospitalizations, and improve clinical markers such as blood pressure, glycemic control, and lipid profiles (10).

Beyond clinical outcomes, the impact of MTM on health-related quality of life (HRQoL) has gained attention. Poor adherence and medication-related harm negatively affect patients' physical, emotional, and social well-being. By optimizing medication use and empowering patients through education, pharmacists can positively influence HRQoL and patient satisfaction (11).

Despite growing evidence of effectiveness, MTM implementation varies widely across countries and healthcare systems. Barriers such as limited reimbursement, lack of access to medical records, insufficient interprofessional collaboration, and inconsistent training continue to limit the full potential of pharmacist-led MTM services (12). Understanding the evidence base and identifying research gaps is essential for advancing MTM practice and policy.

AIM

To critically review the role of pharmacists in Medication Therapy Management and evaluate its impact on:

1. Medication adherence
2. Reduction of drug-related problems
3. Enhancement of health-related quality of life

MATERIALS AND METHODS

A structured narrative review was conducted using peer-reviewed literature assessing pharmacist-led MTM services. Randomized controlled trials, observational studies, systematic reviews, and cohort studies evaluating adherence, DRPs, or HRQoL outcomes were included. Studies not involving pharmacists or lacking outcome measures were excluded.

SEARCH STRATEGY

Electronic databases including PubMed, MEDLINE, Scopus, and Google Scholar were searched up to February 2024 using combinations of keywords such as "Medication Therapy Management," "pharmacist," "medication adherence," "drug-related problems," and "quality of life." Reference lists of eligible articles were manually screened for additional studies.

RESULTS OF SEARCH

Following duplicate removal and screening, 27 studies met the inclusion criteria, comprising randomized controlled trials, observational studies, systematic reviews, and qualitative research. These studies consistently reported positive impacts of pharmacist-led MTM on adherence and DRP reduction, with variable effects on HRQoL depending on study duration and measurement tools.

DISCUSSION

Medication Therapy Management (MTM) represents a cornerstone of contemporary pharmaceutical care, positioning pharmacists as integral contributors to patient-centered healthcare. The findings from the reviewed literature consistently demonstrate that pharmacist-led MTM interventions positively influence medication adherence, reduce drug-related problems (DRPs), and improve health-related quality of life (HRQoL). These outcomes are particularly significant in populations with chronic diseases, polypharmacy, and complex therapeutic regimens (13).

Pharmacists' Clinical Role in Medication Therapy Management

Pharmacists contribute to MTM through systematic evaluation of medication regimens to ensure appropriateness, effectiveness, safety, and adherence. Comprehensive medication reviews allow pharmacists to identify untreated indications, unnecessary medications, suboptimal dosing, and therapeutic duplications, all of which are common contributors to DRPs (14). Studies indicate that pharmacist-led reviews significantly reduce the number of potentially inappropriate medications, especially among elderly patients and those receiving multiple medications (15).

In both community and hospital settings, pharmacists act as a bridge between patients and prescribers. Their frequent contact with patients enables early detection of medication-related issues, while collaboration with physicians ensures timely modification of therapy. Acceptance rates of pharmacist recommendations are consistently high, particularly when pharmacists are integrated into multidisciplinary healthcare teams (16). This collaboration enhances continuity of care and supports safer prescribing practices.

Impact of Pharmacist-Led MTM on Medication Adherence

Medication adherence is a complex behavior influenced by patient-related, therapy-related, and healthcare system factors. Pharmacists address these dimensions through tailored educational and behavioral interventions. Evidence suggests that pharmacist-led MTM significantly improves adherence by addressing patients' misconceptions about medications, alleviating concerns regarding adverse effects, and simplifying complex dosing regimens (17).

Randomized controlled trials in patients with diabetes, hypertension, and cardiovascular diseases have consistently demonstrated improved adherence rates and better clinical outcomes following pharmacist interventions compared to usual care (18). Pharmacist strategies such as motivational interviewing, personalized counseling, medication synchronization, and follow-up consultations have proven particularly effective in sustaining long-term adherence. Importantly, multifaceted interventions combining education, behavioral support, and continuous monitoring yield superior outcomes compared to single-component approaches (19).

Community pharmacists play a critical role in addressing unintentional non-adherence caused by forgetfulness, misunderstanding, or regimen complexity. Through repeated

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patient engagement and accessible counseling, pharmacists enhance patient understanding and promote self-efficacy in medication management (20).

Reduction of Drug-Related Problems Through MTM

Drug-related problems represent a significant source of preventable morbidity and healthcare utilization. Pharmacist-led MTM interventions have demonstrated effectiveness in identifying and resolving DRPs such as adverse drug reactions, drug-drug interactions, incorrect dosing, and inappropriate medication selection. Studies show that a substantial proportion of medication-related hospital admissions could be prevented through pharmacist involvement in medication management (21).

Medication reconciliation during transitions of care is a critical MTM component. Pharmacists conducting reconciliation at hospital admission and discharge significantly reduce medication discrepancies and prevent adverse drug events. These findings highlight the importance of pharmacist involvement during high-risk periods of care.

Deprescribing initiatives led by pharmacists further contribute to DRP reduction by systematically identifying medications with unfavorable risk–benefit profiles. Evidence suggests that pharmacist-led deprescribing improves medication safety without compromising clinical outcomes, particularly in older adults (22).

Enhancement of Health-Related Quality of Life

Improvements in medication adherence and reductions in DRPs have direct and indirect effects on HRQoL. Effective MTM leads to better disease control, fewer adverse events, and reduced symptom burden, thereby improving physical functioning and emotional well-being (23). Studies using validated HRQoL instruments such as SF-36 and EQ-5D report improvements in both physical and mental health domains among patients receiving pharmacist-led MTM services (10,15).

Beyond measurable clinical outcomes, MTM enhances patient satisfaction and confidence in medication use. Patients often report feeling more supported and informed, which strengthens the therapeutic alliance and encourages active participation in care (13). These patient-reported benefits underscore the holistic value of pharmacist-led MTM beyond traditional clinical metrics (24).

Healthcare System and Economic Implications

From a healthcare system perspective, pharmacist-led MTM has the potential to reduce costs associated with medication-related hospitalizations and emergency department visits. Studies indicate that preventing DRPs and improving adherence can lead to substantial cost savings, particularly in chronic disease management. However, economic evaluations of MTM remain limited and heterogeneous, highlighting the need for more robust cost-effectiveness analyses (25).

Barriers to Implementation and Practice Challenges

Despite strong evidence supporting MTM, several barriers hinder its widespread adoption. Limited reimbursement mechanisms, insufficient access to electronic health records, and lack of formal recognition of pharmacists as healthcare providers remain significant challenges (26) . Additionally, variability in MTM training and service delivery affects the consistency and quality of care across settings.

In low- and middle-income countries, constraints such as workforce shortages, limited infrastructure, and lack of policy support further impede MTM implementation. Addressing these barriers requires coordinated efforts involving policy reform, education, and interprofessional collaboration (27).

Future Directions

To maximize the impact of MTM, future efforts should focus focus on integrating pharmacists more fully into healthcare teams, expanding collaborative practice agreements, and standardizing MTM outcome measures. Advances in digital health technologies, including electronic medication records and telepharmacy, offer opportunities to enhance MTM delivery and reach underserved populations.

Barriers to Implementation

Despite demonstrated benefits, MTM implementation faces several challenges. Limited reimbursement models, lack of access to patient health records, and insufficient recognition of pharmacists as healthcare providers hinder service expansion (16,22). Additionally, variability in MTM training and practice standards affects consistency and scalability, particularly in low- and middle-income countries (23).

Gaps in Research

- Limited long-term outcome studies
- Lack of standardized adherence and DRP measures
- Underrepresentation of low-resource settings
- Insufficient cost-effectiveness analyses
- Need for implementation and policy research

CONCLUSION

Pharmacist-led Medication Therapy Management significantly improves medication adherence, reduces drug-related problems, and enhances quality of life. Strong evidence supports expanding pharmacists' clinical roles within healthcare systems. Addressing systemic barriers and standardizing MTM practices are essential to maximize patient outcomes.

REFERENCES

1. Nieuwlaat R, Wilczynski N, Navarro T, Hobson N, Jeffery R, Keepanasseril A, Agoritsas T, Mistry N, Iorio A, Jack S, Sivaramalingam B. Interventions for enhancing medication adherence. Cochrane database of systematic reviews. 2014(11).
2. Cutler RL, Fernandez-Llimos F, Frommer M, Benrimoj C, Garcia-Cardenas V. Economic impact of medication non-adherence by disease groups: a systematic review. BMJ open. 2018 Jan 1;8(1):e016982.
3. Strand LM, Morley PC, Cipolle RJ, Ramsey R, Lamsam GD. Drug-related problems: their structure and function. Dicp. 1990 Nov;24(11):1093-7.
4. Maher RL, Hanlon J, Hajjar ER. Clinical consequences of polypharmacy in elderly. Expert opinion on drug safety. 2014 Jan 1;13(1):57-65.
5. Leendertse AJ, Egberts AC, Stoker LJ, van den Bemt PM, HARM Study Group. Frequency of and risk factors for preventable medication-related hospital admissions in the Netherlands. Archives of internal medicine. 2008 Sep 22;168(17):1890-6.
6. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. American journal of hospital pharmacy. 1990 Mar 1;47(3):533-43.
7. Strand LM, Cipolle RJ, Morley PC. Pharmaceutical care practice. New York: McGraw-Hill; 2012.
8. Hoti K, Hughes J, Sunderland V. Pharmacist prescribing in Australia (Doctoral dissertation, Curtin University of Technology.).
9. Mekonnen AB, McLachlan AJ, Jo-anne EB, Mekonnen D, Abay Z. Medication reconciliation as a medication safety initiative in Ethiopia: a study protocol. BMJ open. 2016 Nov 1;6(11):e012322.

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10. Erku DA, Ayele AA, Mekuria AB, Belachew SA, Hailemeskel B, Tegegn HG. The impact of pharmacist-led medication therapy management on medication adherence in patients with type 2 diabetes mellitus: a randomized controlled study. Pharmacy Practice (Granada). 2017 Sep;15(3).
11. Carter BL, Ardery G, Dawson JD, James PA, Bergus GR, Doucette WR, Chrischilles EA, Franciscus CL, Xu Y. Physician and pharmacist collaboration to improve blood pressure control. Archives of internal medicine. 2009 Nov 23;169(21):1996-2002.
12. Ta JT, Sullivan SD, Tung A, Oliveri D, Gillard P, Devine B. Health care resource utilization and costs associated with nonadherence and nonpersistence to antidepressants in major depressive disorder. Journal of managed care & specialty pharmacy. 2021 Feb;27(2):223-39.
13. Chisholm-Burns MA, Lee JK, Spivey CA, Slack M, Herrier RN, Hall-Lipsy E, Zivin JG, Abraham I, Palmer J, Martin JR, Kramer SS. US pharmacists' effect as team members on patient care: systematic review and meta-analyses. Medical care. 2010 Oct 1;48(10):923-33.
14. Mifsud EM, Wirth F, Camilleri L, Azzopardi LM, Serracino-Inglott A. Pharmacist-led medicine use review in community pharmacy for patients on warfarin. International Journal of Clinical Pharmacy. 2019 Jun 15;41(3):741-50.
15. Lee S, Yu YM, Han E, Park MS, Lee JH, Chang MJ. Effect of pharmacist-led intervention in elderly patients through a comprehensive medication reconciliation: a randomized clinical trial. Yonsei medical journal. 2023 Apr 20;64(5):336.
16. Oladapo AO, Rascati KL. Review of survey articles regarding medication therapy management (MTM) services/programs in the United States. Journal of pharmacy practice. 2012 Aug;25(4):457-70.
17. Radcliffe E, Servin R, Cox N, Lim S, Tan QY, Howard C, Sheikh C, Rutter P, Latter S, Lown M, Brad L. What makes a multidisciplinary medication review and deprescribing intervention for older people work well in primary care? A realist review and synthesis. BMC geriatrics. 2023 Sep 25;23(1):591.
18. Speer M. Using Communication to Improve Patient Adherence. Communicating with Pediatric Patients and Their Families: The Texas Children's Hospital Guide for Physicians, Nurses and Other Healthcare Professionals. 2015:221-7.
19. Sabaté E, editor. Adherence to long-term therapies: evidence for action. World health organization; 2003.
20. Gnjidic D, Hilmer SN. Emergency hospitalizations for adverse drug events. The New England journal of medicine. 2012 Mar 1;366(9):859-author.
21. Silva RD, Macedo LA, Santos GA, Aguiar PM, de Lyra DP. Pharmacist-participated medication review in different practice settings: service or intervention? An overview of systematic reviews. PloS one. 2019 Jan 10;14(1):e0210312.
22. Park S, Jung J, Burke RE, Larson EB. Trends in use of low-value care in traditional fee-for-service Medicare and Medicare Advantage. JAMA network open. 2021 Mar 1;4(3):e211762.
23. Swieczkowski D, Poniatowski P, Merks P, Jaguszewski M. The pharmaceutical care in asthma—Polish and global perspective. Advances in Respiratory Medicine. 2016;84(4):225-31.
24. Conn VS, Ruppar TM, Rn ME, Cooper PS. Patient-centered outcomes of medication adherence interventions: systematic review and meta-analysis. Value in Health. 2016 Mar 1;19(2):277-85.
25. Umeh AU, Chima UE, Agbo CE, Chiekwe OS, Eze AE, Nwachuya CA, Mmuo SS, Nnedu CE, Isah A. Pharmacist-led medication therapy management: impact on healthcare utilization and costs. American Journal of Pharmacotherapy and Pharmaceutical Sciences. 2025 Feb 15;4.
26. Roberts MF, Reeves K, Divine H. Community pharmacists' lack of access to health records and its impact on targeted MTM interventions. Journal of the American Pharmacists Association. 2019 Jul 1;59(4):S81-4.
27. Sharma M, Akhter MS, Roy S, Srejon R. Future issues in global health: challenges and conundrums. International Journal of Environmental Research and Public Health. 2025 Feb 21;22(3):325.

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