The Role of Clinical Pharmacy in Improving Medication Management within the Primary Care Team

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Abstract:

This paper examines the impact of integrating clinical pharmacists into primary care teams to enhance medication management. A systematic literature review was conducted to analyze studies published between 2000-2016 on clinical pharmacy interventions in primary care settings. The review included 25 studies meeting the inclusion criteria. Results demonstrate that clinical pharmacists improve medication appropriateness, reduce medication errors, enhance patient adherence, and contribute to better health outcomes. Integrating pharmacists into primary care teams significantly improved chronic disease management, particularly diabetes, hypertension, and dyslipidemia. Cost savings were also observed in several studies. However, barriers to implementation still need to be addressed, including funding constraints and resistance to expanding pharmacist roles. This review highlights clinical pharmacists' valuable role as part of interdisciplinary primary care teams in optimizing medication therapy and patient outcomes.

Keywords: clinical pharmacy, medication management, primary care, interdisciplinary teams, medication safety, chronic disease management

Introduction:

Medication management is a critical component of primary care, with an estimated 75% of physician office visits involving medication therapy (Starfield et al., 2005). However, medication-related problems are common, with studies showing that up to 25% of primary care patients experience adverse drug events (Gandhi et al., 2003). As the complexity of pharmacotherapy increases, particularly for patients with multiple chronic conditions, there is growing recognition of the need for specialized medication expertise within primary care teams.

Clinical pharmacists are uniquely positioned to address medication-related challenges in primary care settings. With in-depth knowledge of pharmacology, pharmacokinetics, and pharmacotherapeutics, clinical pharmacists can play a vital role in optimizing medication regimens, improving safety, enhancing adherence, and educating patients and other healthcare providers (American College of Clinical Pharmacy, 2008).

Integrating clinical pharmacists into primary care teams represents a promising approach to enhancing medication management and overall quality of care. This paper aims to systematically review the literature on clinical pharmacy interventions in primary care settings, focusing on their impact on medication management, patient outcomes, and healthcare utilization. By synthesizing the available evidence, this review seeks to elucidate the role and value of clinical pharmacists within interdisciplinary primary care teams.

Methodology:

A systematic literature review was conducted to identify relevant studies on clinical pharmacy interventions in primary care settings. The following databases were searched: PubMed, EMBASE, and the Cochrane Library. Search terms included combinations of "clinical pharmacy," "pharmacist," "primary care," "general practice," "medication management," and "medication therapy management."

Inclusion criteria:

1. Studies published between January 2000 and December 2016

- 2. English language publications
- 3. Original research articles (randomized controlled trials, cohort studies, case-control studies, pre-post intervention studies)
- 4. Studies focused on clinical pharmacy interventions in primary care settings
- 5. Studies reporting outcomes related to medication management, patient health outcomes, or healthcare utilization

Exclusion criteria:

- 1. Studies conducted in hospital or specialty care settings
- 2. Review articles, editorials, or commentaries
- 3. Studies focusing solely on economic outcomes without clinical measures

Two reviewers independently screened titles and abstracts for relevance. Full-text articles of potentially eligible studies were assessed against inclusion and exclusion criteria. Data was extracted using a standardized form to capture study characteristics, intervention details, and reported outcomes.

The quality of included studies was assessed using the Cochrane Risk of Bias tool for randomized controlled trials and the Newcastle-Ottawa Scale for observational studies. Due to the heterogeneity of interventions and outcome measures across studies, a narrative synthesis approach was used to summarize and interpret the findings.

Literature Review:

Integrating clinical pharmacists into primary care teams has gained increasing attention over the past two decades as a strategy to improve medication management and patient outcomes. Several key themes emerged from the literature review:

- 1. Medication Appropriateness and Safety: Multiple studies have demonstrated the positive impact of clinical pharmacist interventions on medication appropriateness and safety in primary care. A randomized controlled trial by Zermansky et al. (2001) found that pharmacist-led medication reviews for elderly patients in general practice significantly reduced the number of medicines prescribed and improved the appropriateness of therapy. Similarly, a study by Krska et al. (2001) showed that pharmacist interventions resolved pharmaceutical care issues and improved medication appropriateness scores.
- 2. Chronic Disease Management: Clinical pharmacists have shown particular effectiveness in managing chronic diseases within primary care settings. A systematic review by Chisholm-Burns et al. (2010) found that pharmacist involvement in patient care was associated with improved hemoglobin A1c, blood pressure, and lipid levels. Rothman et al. (2005) demonstrated that a pharmacist-led disease management program for patients with diabetes resulted in significant improvements in glycemic control compared to usual care.
- 3. Medication Adherence: Enhancing medication adherence is crucial to effective medication management. Lee et al. (2006) found that pharmacist interventions, including patient education and follow-up, significantly improved adherence to antihypertensive medications. A study by Murray et al. (2007) showed that a pharmacist-led intervention program improved medication adherence and clinical outcomes in patients with heart failure.
- 4. Collaborative Practice Models: The literature highlights various models of integrating clinical pharmacists into primary care teams. Carter et al. (2009) described a cooperative model where pharmacists worked alongside physicians to manage hypertension and improve blood pressure control. Isetts et al. (2008) evaluated a medication therapy management program delivered by clinical pharmacists in primary care clinics, demonstrating improvements in clinical goals and reductions in healthcare costs.
- 5. Economic Impact: While not the primary focus of this review, several studies have reported on the financial impact of clinical pharmacy services in primary care. Strand et al. (2004) found that pharmacist-provided medication therapy management services in primary care clinics resulted in significant cost savings by resolving drug therapy problems.
- 6. Barriers to Implementation: Despite the positive findings, barriers to integrating clinical pharmacists into primary care teams have yet to be identified. Funding constraints, lack of physical space, and resistance from other healthcare providers have been cited as challenges (Freeman et al., 2012). Additionally,

variations in the scope of practice regulations across jurisdictions can impact pharmacists' ability to fully utilize their skills in primary care settings (Giberson et al., 2011).

Results:

The literature review identified 25 studies meeting the inclusion criteria. These studies encompassed a range of research designs, including randomized controlled trials (n=12), pre-post intervention studies (n=8), and observational cohort studies (n=5). The majority of studies were conducted in the United States (n=14), with others from the United Kingdom (n=5), Canada (n=3), and Australia (n=3).

Table 1 provides a comparison of key outcomes across selected studies:

Study	Design	Sample Size	Primary Intervention	Key Outcomes
Zermansky et al. (2001)	RCT	1188	Pharmacist-led medication review	19% reduction in number of repeat medicines (p<0.001)
Rothman et al. (2005)	RCT	217	Pharmacist-led diabetes management	2.1% reduction in HbA1c vs. 0.9% in control (p=0.03)
Lee et al. (2006)	RCT	200	Pharmacist counseling for hypertension	41% improvement in medication adherence (p<0.001)
Murray et al. (2007)	RCT	314	Pharmacist intervention for heart failure	10.9% improvement in medication adherence (p<0.01)
Carter et al. (2009)	Cohort	402	Collaborative hypertension management	8.7 mmHg greater reduction in SBP vs. control (p<0.05)
Isetts et al. (2008)	Pre- post	285	Medication therapy management	71% of patients achieved ≥ 1 therapy goal (p<0.001)
Strand et al. (2004)	Pre- post	2524	Medication therapy management	y \$2,913,850 total cost savings over 1 year

RCT = Randomized Controlled Trial; HbA1c = Hemoglobin A1c; SBP = Systolic Blood Pressure

Key findings from the reviewed studies include:

- 1. Medication Appropriateness: Studies consistently demonstrated improvements in medication appropriateness following clinical pharmacist interventions. Zermansky et al. (2001) reported a 19% reduction in the number of repeat medicines prescribed, while Krska et al. (2001) found that 70% of pharmaceutical care issues identified by pharmacists were resolved.
- 2. Chronic Disease Management: Clinical pharmacist involvement significantly improved chronic disease outcomes. Rothman et al. (2005) reported a 2.1% reduction in HbA1c for patients with diabetes in the pharmacist intervention group compared to a 0.9% reduction in the control group. Carter et al. (2009) found that collaborative pharmacist-physician management of hypertension resulted in an 8.7 mmHg more significant decrease in systolic blood pressure compared to usual care.
- 3. Medication Adherence: Pharmacist interventions were associated with improved medication adherence across multiple studies. Lee et al. (2006) reported a 41% improvement in adherence to antihypertensive medications, while Murray et al. (2007) found a 10.9% improvement in adherence for patients with heart failure.
- 4. Patient Outcomes: Several studies demonstrated improvements in clinical outcomes and quality of life measures. Isetts et al. (2008) reported that 71% of patients achieved at least one therapy goal following pharmacist-led medication therapy management.
- 5. Healthcare Utilization: Some studies found reductions in healthcare utilization associated with clinical pharmacy interventions. Strand et al. (2004) reported nearly \$3 million in savings over one year by resolving drug therapy problems in primary care clinics.
- 6. Provider and Patient Satisfaction: Qualitative findings from several studies indicated high satisfaction levels among healthcare providers and patients with clinical pharmacist involvement in primary care teams (Freeman et al., 2012; Giberson et al., 2011).

Discussion:

This literature review provides strong evidence for the positive impact of integrating clinical pharmacists into primary care teams to improve medication management. The findings consistently demonstrate that clinical pharmacists can enhance medication appropriateness, improve chronic disease outcomes, increase medication adherence, and contribute to cost savings.

The improvements in medication appropriateness and safety highlight the specialized expertise that clinical pharmacists bring to primary care teams. By conducting comprehensive medication reviews and applying their knowledge of pharmacotherapy, clinical pharmacists can identify and resolve drug-related problems that may be overlooked in routine care. This is particularly important for complex patients with multiple chronic conditions and polypharmacy, where the risk of adverse drug events and interactions is high.

The significant impact on chronic disease management, particularly for conditions like diabetes and hypertension, underscores the value of clinical pharmacists in supporting evidence-based pharmacotherapy. By working collaboratively with physicians and other healthcare providers, clinical pharmacists can help optimize medication regimens, monitor for efficacy and safety, and provide patient education to improve self-management skills.

The improvements in medication adherence observed across multiple studies are crucial, as poor adherence is a significant barrier to effective medication management in primary care. Clinical pharmacists are wellpositioned to address adherence issues through patient education, motivational interviewing, and the development of strategies to overcome barriers to adherence.

While not the primary focus of this review, the economic benefits associated with clinical pharmacy services in primary care are noteworthy. The cost savings reported by studies like Strand et al. (2004) suggest that investing in clinical pharmacy services can lead to overall reductions in healthcare expenditures through improved disease management and prevention of medication-related problems.

Despite the positive findings, several barriers still need to be overcome to implement clinical pharmacy services in primary care successfully. Funding constraints and reimbursement models that need to compensate for cognitive pharmacy services adequately pose significant challenges. Additionally, resistance from some healthcare providers and variations in the scope of practice regulations can limit the ability of clinical pharmacists to practice to the full extent of their training.

To overcome these barriers, continued efforts are needed to:

- 1. Develop sustainable funding models for clinical pharmacy services in primary care
- 2. Educate other healthcare providers on the value and scope of clinical pharmacy practice
- 3. Advocate for consistent regulations that allow clinical pharmacists to practice at the top of their license
- 4. Conduct further research to demonstrate the long-term impact of clinical pharmacy interventions on patient outcomes and healthcare costs.

This review's limitations include the heterogeneity of interventions and outcome measures across studies, which made direct comparisons challenging. Additionally, the focus on studies published up to 2016 may need to capture more recent developments in the field.

Conclusion:

This systematic review provides compelling evidence for the positive impact of integrating clinical pharmacists into primary care teams to improve medication management. The findings demonstrate that clinical pharmacists can enhance medication appropriateness, improve chronic disease outcomes, increase medication adherence, and contribute to cost savings in primary care settings.

Clinical pharmacists' unique expertise in pharmacotherapy makes them valuable members of interdisciplinary primary care teams. They are exceptionally skilled at addressing the challenges of complex medication regimens and chronic disease management. By collaborating with physicians and other healthcare providers, clinical pharmacists can optimize medication therapy, improve patient safety, and enhance the overall quality of care.

While barriers to implementation remain, the evidence supports continued efforts to integrate clinical pharmacy services into primary care models. Future research should focus on developing sustainable funding models, evaluating long-term outcomes, and exploring innovative approaches to maximize the impact of clinical pharmacists in primary care settings.

As healthcare systems continue to evolve towards more team-based and patient-centered models of care, integrating clinical pharmacists into primary care teams represents a promising strategy to improve medication management and ultimately enhance patient outcomes.

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