JOURNAL OF INTERNATIONAL CRISIS AND RISK COMMUNICATION RESEARCH
ISSN: 2576-0017
2024, VOL 7, NO S8

# Epidemiology of Non-Communicable Diseases and pharmacist role in Medication Adherence, and their Management and Monitoring by family physicians in Primary Care

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**Abstract**

This review examines the epidemiology of non-communicable diseases (NCDs) and the critical roles of pharmacists and family physicians in enhancing medication adherence and overall disease management in primary care. NCDs, including cardiovascular diseases, diabetes, and chronic respiratory conditions, account for approximately 71% of global deaths, signifying a substantial public health challenge. Effective management of NCDs requires a multifaceted approach, with medication adherence remaining a prominent barrier to optimal outcomes. Pharmacists contribute significantly through medication therapy management, patient education, and counseling, while family physicians provide comprehensive and continuous care. Collaborative healthcare models that integrate pharmacists into primary care teams are vital for improving adherence, patient engagement, and health outcomes. This review emphasizes the need for interdisciplinary strategies to effectively confront the rising burden of NCDs and enhance quality of life for affected individuals.

## Introduction

Non-communicable diseases (NCDs) have become one of the most pressing public health challenges of the 21st century. Defined as diseases that are not transmissible directly from one person to another, NCDs include a diverse range of conditions such as cardiovascular diseases, diabetes, chronic respiratory diseases, and various cancers. According to the World Health Organization (WHO), approximately 71% of global deaths can be attributed to NCDs, highlighting their significant contribution to mortality and associated morbidity (1). The rising prevalence of NCDs is largely driven by several interconnected risk factors, including unhealthy dietary habits, physical inactivity, tobacco use, and harmful use of alcohol. Rapid urbanization, economic changes, and an aging population further exacerbate this trend, particularly in low- and middle-income countries, leading to an increasing burden on healthcare systems worldwide (2).

The epidemiology of NCDs is complex and multifactorial. For instance, cardiovascular diseases remain the leading cause of death globally, responsible for approximately 17.9 million deaths annually, with hypertension and dyslipidemia being major contributors (3). The prevalence of diabetes has also surged alarmingly, with estimates indicating that around 463 million adults

worldwide were living with diabetes as of 2019, a figure expected to rise significantly over the coming decades due to factors such as obesity and sedentary lifestyles (4). Chronic respiratory diseases, particularly Chronic Obstructive Pulmonary Disease (COPD) and asthma, contribute to millions of deaths each year and significantly diminish the quality of life for many individuals (5). Additionally, the rise of non-communicable diseases imposes considerable economic burdens, leading to increased healthcare costs and losses in productivity, both of which have far-reaching implications for societal welfare.

Effective management of NCDs poses unique challenges. Unlike acute conditions that may resolve with a single intervention, NCDs require long-term treatment strategies that are often complex and multifaceted. This complexity is further compounded by the necessity of adherence to prescribed medication regimens, lifestyle modifications, and ongoing health monitoring. Non-adherence to medication is a significant issue in the management of chronic diseases, with studies showing that nearly 50% of patients with chronic conditions are non-adherent to their prescribed therapies (6). This non-adherence can result from various factors, including lack of understanding of the disease or treatment regimen, psychological barriers, socioeconomic constraints, and complex medication schedules. Consequently, addressing medication adherence is crucial for optimizing health outcomes and minimizing the burden of NCDs on healthcare systems.

Within this framework, pharmacists emerge as critical stakeholders in the management of non-communicable diseases. They possess specialized knowledge concerning pharmacotherapy and are trained to support patients in navigating their medication regimens. Pharmacists' roles have expanded beyond traditional dispensary duties to include direct patient care that emphasizes medication therapy management, adherence counseling, and chronic disease management support. Their involvement is particularly vital in primary care settings, where they can inspire significant improvements in medication adherence through personalized interventions and education (7).

Family physicians, on the other hand, play a pivotal role in the holistic management of patients with NCDs. They serve as the primary point of contact for continuous healthcare, coordinating comprehensive management plans tailored to the unique needs of each patient. This includes not only the clinical oversight of medications but also the integration of lifestyle interventions and monitoring procedures to optimize patient outcomes. Family physicians' ongoing relationships with patients allow for better identification of barriers contributing to non-adherence and more effective engagement in shared decision-making (8). Moreover, the collaboration between pharmacists and family physicians represents an important model for improving care quality. Through interdisciplinary teamwork, these healthcare providers can jointly strategize to enhance medication adherence and overall disease management.

The escalating prevalence of non-communicable diseases necessitates a re-examination of healthcare strategies in the management and prevention of these conditions. The integration of pharmacists into primary care teams, alongside family physicians, offers a promising approach to address the issues surrounding medication adherence and the multifaceted nature of chronic disease management. This review endeavors to further explore the epidemiology of NCDs, the critical role pharmacists play in promoting medication adherence, and the collaborative management efforts spearheaded by family physicians in primary care settings.

**Review:**

**Epidemiology of Non-Communicable Diseases**

The epidemiological landscape of NCDs is diverse and multifactorial, influenced by a range of behavioral, environmental, and genetic factors. Cardiovascular diseases, which are responsible for an estimated 17.9 million deaths annually, remain the leading cause of death globally. Risk factors such as hypertension, dyslipidemia, tobacco use, unhealthy diets, and physical inactivity significantly contribute to the incidence of these diseases (Benjamin et al., 2019). Diabetes, particularly type 2 diabetes, has seen a dramatic rise in prevalence, with an estimated 463 million adults affected globally as of 2019, and projections suggesting that this number could increase to 629 million by 2045 (1). The rapid increase in diabetes prevalence correlates strongly with rising obesity rates and sedentary lifestyles, particularly in low- and middle-income countries where urbanization and lifestyle transitions are occurring at an alarming pace (Global Burden of Disease Study, 2019). Chronic respiratory diseases, such as Chronic Obstructive Pulmonary Disease (COPD) and asthma, also contribute significantly to morbidity and mortality. The WHO reports that around 3 million people die from COPD each year, with many cases linked to outdoor and indoor air pollution, occupational hazards, and tobacco smoke (2).

The implications of this rising burden of NCDs on healthcare systems are profound. NCDs often require long-term management strategies that involve complex medication regimens, lifestyle interventions, and continuous monitoring, which can be overwhelming for patients. Additionally, adherence to medication regimens is compounded by socioeconomic factors, health literacy, and the psychological burden of managing chronic diseases (3). Non-adherence not only diminishes therapeutic efficacy but is also linked with increased hospital admissions, morbidity, and mortality rates among individuals with NCDs (4). Therefore, addressing the multifaceted barriers to medication adherence is essential for improving patient outcomes and reducing the overall healthcare burden associated with these diseases.

**The Role of Pharmacists in Medication Adherence**

Pharmacists are increasingly recognized as vital contributors to the management of NCDs and improving medication adherence. Staffed in various healthcare settings, pharmacists serve as accessible healthcare professionals who can bridge the gap between patients and the complex healthcare system. One of the paramount roles of pharmacists in enhancing medication adherence is through medication therapy management (MTM) services, which involve comprehensive medication reviews, counseling, and education tailored to individual patient needs. A systematic review (5) highlighted that pharmacists' interventions, which can include educational reinforcement, addressing medication side effects, and optimizing drug regimens, substantially increase adherence rates by 15% to 25% among patients with chronic illnesses.

The pharmacist's role extends beyond medication dispensing; they facilitate proactive medication reconciliation, ensuring continuity of care and reducing the risk of potential drug interactions or adverse effects. Additionally, pharmacists can implement innovative strategies such as medication synchronization, which aligns refill schedules for chronic disease medications, thereby minimizing missed doses and enhancing adherence. This type of intervention has been shown to increase the likelihood of medication refills and improve overall therapeutic outcomes (5).

Pharmacists also play a significant part in patient education, a critical component in adherence promotion. They provide patients with essential information about their conditions and the importance of adhering to prescribed regimens, addressing barriers like misunderstanding medication dosages or routes of administration. Moreover, through counseling sessions,

pharmacists can identify personal and socioeconomic factors that may inhibit adherence, such as financial constraints or transportation challenges, and work with patients to develop tailored solutions. Research indicates that when patients perceive pharmacists as trustworthy healthcare providers, their willingness to engage in medication management increases, thereby positively influencing adherence rates (6).

Furthermore, pharmacists' involvement in interdisciplinary teams enhances patient management and adherence. Collaboratively, pharmacists and family physicians can identify high-risk patients based on their medical history and medication profiles, allowing for targeted interventions. This partnership is reinforced by data indicating that collaborative models, where pharmacists are integrated into primary care teams, result in improved adherence and better overall health outcomes (7).

**Management and Monitoring by Family Physicians in Primary Care**

Family physicians hold a central role in the comprehensive management and long-term monitoring of patients with NCDs. They are responsible for devising and implementing individualized treatment plans that consider the unique needs and circumstances of each patient. This responsibility involves regular assessments of patients' health status, including monitoring vital signs, laboratory parameters, and ensuring appropriate screenings for complications associated with various NCDs (8). Family physicians must also stay informed about the latest treatment guidelines and advancements in pharmacotherapy to provide evidence-based care.

One of the primary challenges faced by family physicians in managing NCDs is the identification of non-adherence to medications—an issue that frequently arises during routine follow-up visits. Regular follow-ups can help physicians detect signs of non-adherence, which may include elevated blood glucose levels in diabetic patients or uncontrolled hypertension in those with cardiovascular conditions. To address these challenges, family physicians can engage in active dialogues with patients about their medication regimes, encouraging them to express concerns regarding adherence and offering motivation to reinforce commitment to treatment plans. Studies suggest that empathetic communication and patient-centered care approaches can significantly enhance adherence and overall patient satisfaction (9).

Equally important is the need for family physicians to leverage technology and digital health tools in the monitoring and management of NCDs. Utilizing electronic health records (EHRs) can enhance communication among healthcare professionals, improving the accuracy of medication records and tracking patient progress over time. Digital health solutions, such as mobile health applications and telemedicine, have also emerged as viable platforms for ongoing engagement with patients, allowing for remote monitoring of health parameters and better management of chronic conditions (10). These tools can contribute to a more proactive approach in identifying adherence issues and tailoring interventions accordingly.

Moreover, the establishment of integrated care pathways that involve multi-disciplinary approaches including pharmacists, nurses, dietitians, and other healthcare providers has been shown to enhance the effectiveness of NCD management strategies. Evidence indicates that such integrated models improve patient outcomes by fostering a holistic approach that not only addresses medication adherence but also lifestyle modifications and patient education (11). Family physicians, therefore, act as orchestrators of care, facilitating communication, education, and coordinated efforts among the healthcare team to ensure that patients receive comprehensive and cohesive management of their NCDs.

## Conclusion

The rising prevalence of non-communicable diseases necessitates urgent and coordinated action within healthcare systems globally, particularly concerning the challenges of medication adherence. Pharmacists and family physicians play pivotal roles in addressing these challenges within primary care settings. Pharmacists enhance medication adherence through comprehensive medication management, patient education, and collaborative care efforts with physicians. Family physicians are essential for the holistic management and long-term monitoring of patients with NCDs, emphasizing the importance of integrated care models that leverage the expertise of diverse healthcare professionals. Strengthening these collaborative partnerships and focusing on patient-centered strategies will be critical to improving health outcomes, enhancing quality of life, and reducing the burden of NCDs on individuals and healthcare systems.

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