Macedonian Pharmaceutical Bulletin, 72 (Suppl 1) 33 - 34 (2026)
Online ISSN: 1857-8969
DOI: 10.33320/maced.pharm.bull.2026.72.03.015
Short communication

Can improving medication adherence improve treatment outcomes?

Maja Ortner Hadžiabdić*

University of Zagreb Faculty of Pharmacy and Biochemistry, Ante Kovačića 1, 10 000 Zagreb, Croatia

Introduction

Medication adherence has been a major focus of healthcare research for more than five decades. Early research was based on the concept of compliance, which implied passive patient obedience to healthcare professionals' recommendations. Over time, the terminology evolved toward adherence, emphasizing patients' active participation in treatment decisions, and later toward concordance, highlighting a collaborative partnership between patients and healthcare providers (Vrijens et al., 2012; WHO 2003) This conceptual shift reflects the growing recognition that successful pharmacotherapy depends not only on prescribing effective medicines but also on patients' ability and willingness to use them as intended.

Regardless of research and discussions on adherence, data show that approximately half of the patients with chronic diseases still do not take their medications as prescribed (WHO 2003). Poor adherence has been associated with disease progression, preventable hospitalizations, increased healthcare costs, and premature mortality (Osterberg et al., 2005). Consequently, improving adherence has often been viewed as one of the most effective strategies for enhancing the value of healthcare interventions.

However, a critical question remains: does improving adherence consistently translate into better clinical outcomes? This review critically examines the current evidence regarding adherence-enhancing interventions and their impact on treatment outcomes, with particular attention to methodological quality and implementation opportunities.

Relationship between adherence and health outcomes

The most influential evidence synthesis in this field, the Cochrane review by Nieuwlaat et al., analyzed more than 180 randomized controlled trials evaluating interventions designed to improve medication adherence (Nieuwlaat et al., 2014). Although several interventions improved adherence, effects were generally modest, and improvements in clinical outcomes were inconsistent. Importantly, no single intervention emerged as universally effective, simple to implement, and capable of consistently improving both adherence and health outcomes across different patient populations. This discrepancy may partly reflect methodological challenges, but also "healthy adherer effect" complicates interpretation because patients who adhere to medication recommendations often engage in other health-promoting behaviors that independently contribute to better outcomes.

Research has shown that improvements in adherence do not automatically translate into better clinical outcomes. Regarding patient population, the strongest evidence is available for HIV infection,

*maja.ortner@pharma.unizg.hr

where adherence is directly associated with viral suppression, prevention of drug resistance, and long-term disease control (Conn et al., 2016; Nieuwlaat et al., 2014). Cardiovascular diseases and diabetes provide another important example. Improved adherence to antihypertensive, lipid-lowering, diabetes and secondary prevention therapies is associated with better control of cardiovascular risk factors, and HbA1c values, but there is low evidence to demonstrate effects on hard endpoints such as cardiovascular mortality (Conn et al., 2016; Nieuwlaat et al., 2014).

The nature of medication adherence enhancing interventions

Evidence consistently demonstrates that simple interventions alone rarely produce substantial or sustained improvements in adherence. The strongest evidence supports multifaceted interventions combining educational, behavioral, and organizational components. These typically include individualized counselling, motivational interviewing, identification of adherence barriers, regular follow-up, monitoring of medication use, and feedback to patients and healthcare professionals. Meta-analyses suggest that interventions targeting behavioral change and habit formation achieve greater improvements than those focused solely on information provision (Nieuwlaat et al., 2014).

Implementation of medication adherence enhancing interventions

Although considerable progress has been made in identifying interventions capable of improving medication adherence, implementation remains the major challenge. The interventions associated with the greatest improvements in adherence and clinical outcomes are often the most resource-intensive and difficult to sustain in routine practice. Future research should move beyond the question of whether adherence can be improved and focus on how effective interventions can be integrated, scaled, and maintained within real-world healthcare systems (Hogervorst et a., 2023).

Conclusion

The available evidence demonstrates that medication adherence can be improved, particularly through multifaceted interventions that combine educational, behavioral, and organizational strategies.

The major challenge for future research is not merely to identify additional adherence-enhancing interventions, but to determine which approaches produce clinically meaningful benefits and can be sustainably integrated into routine healthcare. From a European perspective, the greatest opportunity may lie not in developing new adherence interventions, but in implementing existing evidence-based strategies through sustainable, pharmacist-supported, and technology-enabled models of care.

References

Conn, V.S. et al., 2016. Patient-centered Outcomes of Medication Adherence Interventions: Systematic Review and Meta-Analysis. Value Health 19, 277–285.

Hogervorst, S.T. et al., 2023. Scalability of effective adherence interventions for patients using cardiovascular disease medication: A realist synthesis-inspired systematic review. Br. J. Clin. Pharmacol. 89, 2220–2238.

Nieuwlaat, R. et al., 2014. Interventions for enhancing medication adherence. Cochrane Database Syst. Rev. 11.

Osterberg, L., Blaschke, T., 2005. Adherence to medication. N. Engl. J. Med. 353, 487–497.

Vrijens, B. et al., 2012. A new taxonomy for describing and defining adherence to medications. Br. J. Clin. Pharmac. 2003(73), 691–705.

World Health Organization, 2003. Adherence to Long-Term Therapies: Evidence for Action. Geneva: WHO.