



COMPREHENSIVE STUDY ON MEDICATION ADHERENCE: A DETAILED REVIEW

¹Nihal P M, ²Neethu J, ³Dilip krishnan, ³ Dr. Lal prasanth M L

¹Student, ²Associate professor, ³Associate professor, ³professor

¹Department of Pharmacy Practice,

¹Dr.Moopen's college of pharmacy, Meppadi , India

Abstract: Medication adherence is a major problem in health care and has a big impact on how well diseases are treated and controlled. The degree to which a patient takes their prescription as directed is referred to as medication adherence. Patient morbidity, mortality, cost effectiveness, and poor health outcomes can all be negatively impacted by poor medication adherence. In this review we discussed about various barriers affecting medication adherence such as patient specific factors, medication related factors, disease related factors, health care and system specific barriers. Also there are various direct and indirect methods are used for measuring medication adherence including adherence rating scale. From the patient's perspective, communication, confidence in the patient-provider relationship, support, and enough resources proved to be the most important facilitators of medication adherence. Improving medication adherence by using supporting tools such as reminder charts, pill card, alarms and mobile apps. Pharmacists have an important role in medication adherence. They can verify that patients are taking the right prescriptions and aren't using any other medications or treatments that might reduce the efficiency of critical therapy.

KEYWORDS: Medication adherence, patient care, medication, drugs, factors

I. INTRODUCTION

Medication adherence is a major problem in the health care and have significant impact in the treatment and control of disease. Medication adherence is defined by the World Health Organization as "the degree to which the person's behavior corresponds with the agreed recommendations from a health care provider".^[1]

Also according to the American Medical Association A patient is considered adherent if they take 80% of their prescribed medicine(s). If patients take less than 80% of their prescribed medication(s), they are considered non adherent. ^[2]

Medication non adherence are of classified into two subdivisions. First is primary non adherence. Primary non adherence occurs when a doctor orders a new drug, but neither the patient nor the pharmacist ever fills the order.. Second type is secondary non adherence. It occurs when the patients stop taking medication after taking it. The most precise methods of determining adherence are direct measures, which indicate that a drug has been consumed assessing its presence in blood, urine, or other body fluid, or by detecting a biologic marker.^[3]

The eight-item Morisky scale is a self-reported adherence measure that is organized, validated, and commonly used. It is simple to include in a follow-up visit and has been shown to be predictive of adherence.^[3]

Consequences of nonadherence

Poor medication adherence can have a negative influence on patient morbidity and mortality, clinical trials, the cost-effectiveness of medical care, and clinical decision-making by healthcare providers. It also portends poorer health outcomes.^[3]

Public health costs associated with non adherence are also significant. According to a research from the Centers for Disease Control and Prevention (CDC), 10% of all healthcare expenditures in the US is wasted because of medication non adherence in chronic diseases, which can cost up to \$300 billion yearly. The average cost of healthcare for individuals who have cardiovascular disease who are non adherent is significantly greater than the average cost for patients who are adherent. For instance, non adherent patients with heart failure had annual healthcare costs that is \$8881 more than adherent patients.^[3]

Barriers to medication adherence

Adherence is a multidimensional phenomenon that is influenced by various factors. Some of the barriers related to medication adherence are shown in the figure 1.^[4]

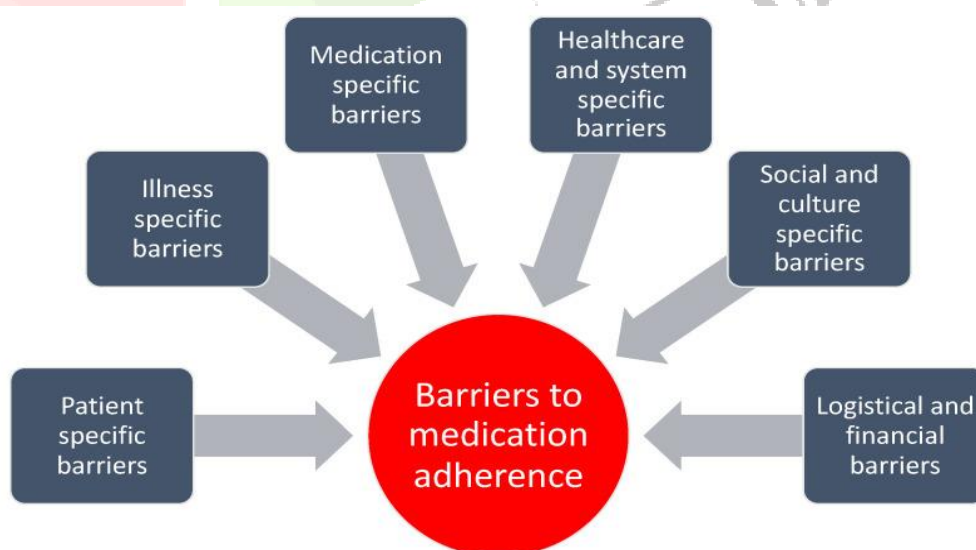


Fig 1. Barriers of medication adherence^[4]

❖ Patient specific barriers

Patient specific factor is an important barrier to medication adherence. It's possible that patients are not sufficiently informed or knowledgeable about their medication schedule. Patients develop forgetfulness because they may not have had follow-up care after receiving drug information and adherence counseling at the outset of their disease. If the patient is severely unwell at the time of counseling, it may be challenging to alter the information presented, and misconceptions can arise. Patients frequently adjust their dosages to fit their understanding because they might not understand the significance of taking their prescription exactly as prescribed. They may have erroneous or misleading beliefs about medicines. They can lack motivation and think they have little power to control the sickness.^[4]

Medication adherence may be impacted by stress and helplessness. Patients may feel uncomfortable when taking injectable medications and fear that doing so would harm their bodies. When administering the medication, which could require exceptional eyesight, patients' physical impairments can also pose a problem. In addition to making adherence issues worse, poor health literacy can make it difficult for patients to grasp the language, particularly if it is written in a language other than their mother tongue. Comorbidity may increase non-adherence probability.^[6]

❖ Disease related factors

Contrary to the worries of healthcare professionals, the patient's priorities are not always related to their condition. Although it could be an unpleasant experience, other issues in life are more important. A patient could have a negative emotional reaction to their illness and start to value their health more than they previously did. The necessary life adjustments might not be a top priority. Patients may sometimes argue that their condition is not serious enough to require taking their prescription exactly as directed. How seriously the patient evaluates their circumstance may influence their decision to take or not take medication.^[5]

Sometimes the difficulty arises from the patient's refusal to accept their illness or belief that it is someone else's fault. Because it can vary from condition to condition, negative thoughts about disease or many diseases can result in increased barriers to drug adherence. Cancer poses a greater risk to life than diabetes, yet diabetes can have serious effects if the treatment is not taken properly. Fatigue and extreme exhaustion brought on by the illness itself may result in a negative impact on adherence.^[8]

❖ Medication specific factors

It's possible that patients are unaware of their disease when it first manifests or the medications they require. The intensity and prognosis of the illness often baffle people. They can frequently think that the treatment is difficult and time consuming. Adherence can be affected as a result of patients' perceptions of taking medication, which may be connected to disease. If a patient finds it difficult to incorporate their prescription into their daily lives, they may not take it as prescribed. It might be required to work shifts, and staying up late might make it difficult to keep to a pattern. People are concerned that once they begin taking a medication, they will have to do so forever.^[9]

Problems with side effects tend to commonly make it difficult to follow a medication regimen. Patients who are afraid or worried about their safety may choose not to take their prescription. The size of the tablet, a metallic aftertaste, or a sore throat are a few examples of physical barriers that might make it challenging to take medication. Fear of needles can prevent people from injecting insulin. There are drawbacks for certain people when transitioning from oral tablets to injectable drugs.^[9]

❖ **Healthcare and System-Specific Barriers**

Long wait times and challenging access to healthcare contribute to poor adherence to medications. Treatment problems may be caused by fragmented treatment provided by many prescribers, a breakdown in communication between a general practitioner and a local pharmacy, and inefficient primary and secondary care coordination. They might eventually lead to the care being discontinued.^[6,10]

Patient counseling is insufficient as a result of poor patient-provider contacts, and the patient is left to struggle alone with medication-related problems. Without trust-based patient-provider communication, patients cannot discuss side effects and other medication-related difficulties freely. Failure of healthcare professionals to discuss adherence difficulties with patients and listen to their concerns and experiences may have an impact on the degree of patients' self-efficacy. Lack of confidence in medical professionals and uncertainty about their understanding may have a substantial negative impact on a patient's adherence behavior, which may make managing their disease more challenging.^[11]

❖ **Logistical and Financial Barriers**

Main challenge to medication adherence include financial restrictions and medicine costs. The capacity to purchase medications can be affected by unemployment and financial troubles. Medicines are unlikely to be a priority if a patient does not have enough money to purchase basic essentials like food and clothing. Having trouble getting to the doctor, particularly in developing nations, might make it difficult to manage your medications well. The cost of medicine may be intolerable if insurance coverage is insufficiently extensive or nonexistent. The availability of medications at the clinic or pharmacy, particularly in developing countries, might cause serious issues for the continuity of care.^[12]

Methods of measuring medication adherence

Researchers and doctors both prioritize measuring adherence. An incorrect assessment of drug adherence can result in a number of issues that could be costly and dangerous in both settings. Costly diagnostic procedures may be carried out, treatment may be ineffective and even escalated, and helpful therapies may be judged ineffective. Measuring medicine adherence can be challenging, though, because the parameters of acceptable adherence need to be accurately established and tailored to the requirements of each patient. There are several tools available for these measurements, but they must demonstrate their validity, dependability, and change sensitivity. The approach to be used to check for adherence should be chosen based on the study results or the clinical settings objectives and resources.^[13]

Test		Advantages	Disadvantages
Direct Methods	Directly observed therapy	Most accurate	Patient can hide pill in the mouth and then discard them; impractical for routine use
	Measurement of the level of medicine or metabolite in blood	Objective	Variation in the metabolism which can give a false impression of adherence; expensive
	Measurement of biological marker in the blood	Objective; in clinical trails,can also be used to measure placebo	Requires expensive quantitative assays and collection of body fluids
Indirect methods	Patient questionnaires,patient reports	Simple, inexpensive, most useful method in clinical setting	Susceptible to error with increases in time between visits; results are easily distorted by the patient
	Pill counts	Objective, quantifiable, easy to perform	Data easily altered by patient (eg:pill dumping)
	Rates of prescription refills	Objective ,easy to obtain data	A prescription refill is not equivalent to ingestion of medication; requires a closed pharmacy system
	Assessment of the patient's clinical response	Simple, generally easy to perform	Factors other than medication adherence can affect clinical response
	Electronic medication monitors	Precise, results are easily quantified, tracks patterns of taking medication	Expensive, requires return visits and downloading data from medication vials
	Measurement of physiologic markers (eg: heart rate in patients taking beta blockers)	Often easy to perform	Marker may be absent for other reasons (eg: increased metabolism, poor absorption, lack of response)
	Patient diaries	Help to correct poor recall	Easily altered by patient

	When the patient is child questionnaire for caregiver or teacher	Simple, objective	Susceptible to distortion
--	--	-------------------	---------------------------

❖ MARS (Medication Adherence Rating Scale)

The Medication Adherence Rating Scale (MARS) is a 10-item self-reporting multidimensional instrument that assesses three dimensions: medication adherence behaviour (items 1-4), attitude towards taking medication (items 5-8), and negative side effects and attitudes regarding psychiatric medication (items 9-10).^[5]

❖ Medication Possession Ratio (MPR)

Medication possession ratio is a method to calculate medication adherence and is defined as being Adherent Patients if the amount of medication furnished to the patient is at least 80% based on days supply of medication divided by the number of days patients should be consuming the medication.^[5]

$$\text{MPR} = \left(\frac{\text{Sum of days' supply for all fills in period}}{\text{Number of days in period}} \right) \times 100\%$$

Practices to improve medication adherence

- ❖ **Understand the reasons for patient non adherence** – Without an understanding of the factors influencing a patient's non adherence, providers and healthcare professionals cannot effectively assist patients. Providers can avoid making any assumptions and start assisting patients in finding solutions by engaging with patients and determining the real causes of the problem.^[14]
- ❖ **Recognize polypharmacy risks** – Polypharmacy is the term for when a patient is taking five or more drugs. Adherence becomes more challenging the more medications a patient takes. Associated issues could include confusing instructions, a complicated dose schedule, reactions, side effects, a high cost, and frequent medication refilling.^[14]
- ❖ **Improve communication and collaboration** – The ability of a physician to communicate with patients effectively and patients feeling comfortable speaking with their provider are two other critical best practices to increase medication adherence. Motivational interviewing, a patient-centered, non-confrontational communication skill set, is one method that may aid in communication and collaboration. It can effectively guide patient dialogues about prescription concerns and adherence.^[15]
- ❖ **Prioritize education** – Patient education is essential for enhancing medication adherence. Giving patients the knowledge they require allows them to take an active role in their own care. Provide patients

with information on topics including following prescriptions, the dangers of taking medications other than those that have been given, and where to go for help and solutions.^[15]

How to improve medication adherence

- ❖ **Focus on risks** – Patients may benefit greatly from being made aware of the dangers of missing or skipping medicines. Even if the occasional missed dose might not have a negative effect, make sure your patients are aware that their medication works best when it is taken as directed.^[17]
- ❖ **Review side effects** –Patients may be more prone to discontinue taking their medication if there are unwanted side effects. Preparing patients in advance is crucial since there can be unexpected adverse effects when combining prescription medications with over-the-counter medications. ^[17]
- ❖ **Give patients a response plan** – Make sure you are prepared to discuss a response plan with patients because the discussion regarding risks and side effects may be distressing for them. Help them understand how to deal with adverse effects, what to do if they miss a dose, and how to get in touch with someone if they have any problems. ^[17]
- ❖ **Recommend support tools** – Lastly , give patients tools that can help with drug adherence.
 - ❖ Reminder Chart
 - ❖ Pill Card
 - ❖ Educational Videos
 - ❖ Pill Organizer
 - ❖ Digital Dispenser
 - ❖ Mobile App
 - ❖ Alarm^[17]

Role of pharmacist in medication adherence

Pharmacists have an important role in helping patients adherence to their medication regimens. They can verify that patients are taking the right prescriptions and aren't using any other medications or treatments that might reduce the efficiency of critical therapy. Pharmacists must be diligent in including the patient in the treatment process if they are to be successful in ensuring medication adherence.pharmacists can also increase medication adherence b By setting up a system that sends texts, emails, or calls to remind patients about their prescription schedule and refills.^[17]

Clinical interventions are the expert acts taken by licensed pharmacists with the goal of enhancing the efficacy of medication use. These suggestions can be to alter the patient's medication regimen, the method of medication administration, or the way the patient takes their medications.^[17]

Medication Therapy Management (MTM)

Medication Therapy Management (MTM) is a consumer-friendly program designed by pharmacists to find and resolve the more at-risk patients. MTM is a healthcare service where in the medicines are delivered in a face-to-face visit between the pharmacist and the patient. MTM is more beneficial for people who use eight or more different medicines regularly.^[16]

As per the latest health care reform laws such as the Patient Protection and Affordable Care Act, pharmacists will be paid for providing MTM services for patients. To help achieve these results, the Pharmacist takes an important role in wide range of MTM services, such as Comprehensive Medication Reviews, Targeted Interventions, Adherence Monitoring Interventions, Cost-Effective Interventions, and Transitions in Care, among others.. If MTM consultation costs fall under a set of criteria established by the Centers for Medicare & Medicaid Services, they may be reimbursed. Medication Therapy Management is a medical service with a lot of potential because it increases patient adherence while giving pharmacists an extra source of income.^[16]

CONCLUSION

Medication adherence is a major problem in the health care and have significant impact in the treatment and control of disease. There are various barriers to medication adherence and these barriers can be overcome by various practices and smart options. Also pharmacist have a important role in improving the medication adherence. They can verify that patients are taking the right prescriptions and aren't using any other medications or treatments that might reduce the efficiency of critical therapy. Medication management therapy is a programme designed by pharmacist to resolve problems to increase the medication adherence.

REFERENCES

1. Beena Jimmy, Jimmy Jose .Patient Medication Adherence: Measures in Daily Practice Oman Med Jornal .2011 May; 26(3): 155–159.
2. Hugtenburg J.G, Timmers L, Elders P. J, Vervloet M, van Dijk L. Definitions, variants, and causes of nonadherence with medication: a challenge for tailored interventions. Patient Preference and Adherence.7 edition. Google Scholar; 2019 ;675-682.
3. Ileana L. Piña ,, Katherine E. Di Palo , Marie T. Brown , Niteesh K. Choudhry , Jamie Cvangros ,Deborah Whalen , Laurie P. Whitsel , Janay Johnson. Medication adherence: Importance, issues and policy: A policy statement from the American Heart Association. Elsevier. 2020; 2-3.
4. Kirsi Kvarnström, Aleks Westerhol , Marja Airaksinen, Helena Liira. Factors Contributing to Medication Adherence in Patients with a Chronic Condition: A Scoping Review of Qualitative Research. MDPI publishers. 2021; 1-5.

5. Godspower O. OwieSunday O. OlotuBawo O. Jame. Reliability and validity of the Medication Adherence Rating Scale in a cohort of patients with schizophrenia from Nigeria. *scielo* 5 .2018 Apr-jun; 6.
6. Goldsmith L.J, Kolhatkar A, Popowich D, Holbrook A.M, Morgan S.G, Law M.R. Understanding the patient experience of cost-related non-adherence to prescription medications through typology development and application. *Soc. Sci. Med.* 2017, 194,51–59.
7. Van Geffen E.C, Hermsen j, Heerdink E.R, Egberts A.C, Verbeek-Heida P.M, van Hulten R. The decision to continue or discontinue treatment: Experiences and beliefs of users of selective serotonin-reuptake inhibitors in the initial months—a qualitative study. 2011, 7, 134–150.
8. Todd Rupp R.N. Understanding Barriers to Medication Adherence. Robert Wood Johnson Foundation Nurse Faculty Scholar Sinclair School of Nursing, University of Missouri. 2013–2016; 1-13
9. Maria Sacha, Hinuga Sandahl, Line Harck, Jessica Carlsson. "Treatment adherence to psychotropic drugs among non-Western migrants: a systematic review", *Nordic Journal of Psychiatry*, 2021; 12-20.
10. Juhi Singh, Md Shamshir Alam, Anuj Malik, Shubham Singh Tyagi, Mohd Tousib, Nawazish Alam, Arinjay Jain, Paluck Paluck. Ways to Improve Medication Adherence in Chronic Disease Patients – A Review, *Journal of Evolution of Medical and Dental Sciences*, 2021; 10
11. Kirsi Kvarnström, Aleks Westerholm, Marja Airaksinen, Helena Liira. "Factors Contributing to Medication Adherence in Patients with a Chronic Condition: A Scoping Review of Qualitative Research", *Pharmaceutics*, 2021;22-28
12. Rahmawati, R.; Bajorek, B. Understanding untreated hypertension from patients' point of view: A qualitative study in rural Yogyakarta province, Indonesia. *Chronic Illn.* 2018, 14; 228–240.
13. Eduardo, S. Adherence to Long-Term Therapies: Evidence for Action; World Health Organization: Geneva, Switzerland, 2003;3-7.
14. Nieuwlaat, R.; Wilczynski, N.; Navarro, T.; Hobson, N.; Jeffery, R.; Keepanasseril, A.; Agoritsas, T.; Mistry, N.; Iorio, A.; Jack, S.; et al. Interventions for enhancing medication adherence. 2014; 10-14.
15. Goldsmith, L.J.; Kolhatkar, A.; Popowich, D.; Holbrook, A.M.; Morgan, S.G.; Law, M.R. Understanding the patient experience of cost-related non-adherence to prescription medications through typology development and application. *Soc. Sci. Med.* 2017, 194;51–59.
16. Nielsen, T.M.; Juhl, M.F.; Feldt-Rasmussen, B.; Thomsen, T. Adherence to medication in patients with chronic kidney disease: A systematic review of qualitative research. *Clin. Kidney J.* 2018; 513–527. Joseph Parks. Clinical strategies to promote medication adherence . National council for behaviour health. HRSA. 2017 ;1-8