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Systematic Review

Factors affecting medication adherence in patients with chronic diseases: A systematic literature review

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ABSTRACT

Objective: This review seeks to explore the main determinants of medication adherence among patients with chronic conditions, with the goal of informing future studies.
Methods: A systematic review of the literature was conducted to identify factors influencing medication adherence in chronic disease patients, using the COM-B (Capacity, Opportunity, Motivation–Behavior) model as an analytical framework.
Results: Medication adherence in patients with chronic conditions is directly or indirectly shaped by three categories of factors: capacity (e.g., physical and cognitive functioning, knowledge of disease and treatment, and habitual behavior), opportunity (e.g., access to information and learning resources, social influences, support from significant others, and financial resources), and motivation (e.g., self-efficacy, personal goals, illness perceptions, and attitudes toward medication).
Conclusion: This review highlights that medication adherence in chronic disease patients is shaped by multidimensional factors. Research has evolved from focusing on single-factor analyses to multi-dimensional approaches, with a shift from observational studies to interventional designs. Accordingly, tailored, multidimensional strategies should be developed to improve adherence among different patient groups.

With the development of China's economy and the transformation of its population structure, there has been a notable shift in the country's disease and mortality profiles. Chronic diseases—particularly cardiovascular diseases, diabetes, and cancer—have become the leading threats to public health. According to the Report on Nutrition and Chronic Diseases of Chinese Residents (2020), chronic diseases accounted for 88.5 % of all deaths in China in 2019, with cardiovascular diseases, cancer, and chronic respiratory illnesses contributing to 80.7 %.[1]

Medication therapy remains a cornerstone in managing chronic diseases by controlling symptoms, slowing disease progression, and preventing complications, thereby enhancing patients' survival rates and quality of life.[2] Given that chronic diseases are typically lifelong conditions, patients require long-term or even lifelong pharmacological treatment. The prolonged treatment duration and common polypharmacy may adversely impact medication adherence.

The World Health Organization pointed out that improving medication adherence can yield greater health benefits globally than the development of new treatments.[3] Therefore, conducting a comprehensive and accurate assessment of medication adherence among patients with chronic diseases is essential for both slowing disease progression and reducing burdens on families and the healthcare system.

Identifying the key factors that influence medication adherence in patients with chronic diseases is of great importance. However, existing reviews mostly focused on single conditions such as hypertension or diabetes, or on specific populations such as older adults and rural residents. Moreover, many of these reviews analyze influencing factors from limited perspectives—typically sociodemographic or psychological characteristics—using inductive approaches with insufficient theoretical grounding and lacking systematic integration of findings.[4,5]

This review aims to synthesize literature on the factors influencing medication adherence among patients with chronic diseases. Guided by the Capacity, Opportunity, Motivation–Behavior (COM-B) model, it seeks to categorize key determinants, thereby offering a theoretical foundation for developing effective strategies to enhance medication adherence in this population.

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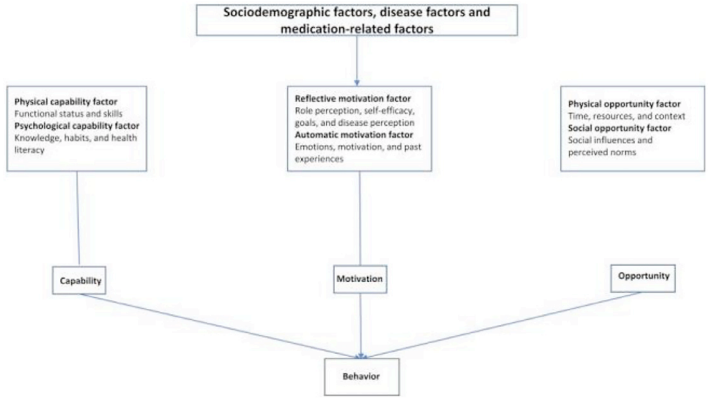

Fig. 1. Conceptual framework of factors influencing medication adherence in patients with chronic diseases.

Materials and methods

Data sources

This review retrieved studies from four English-language databases—PubMed, Embase, Web of Science, and Scopus—and three Chinese-language databases: CNKI, Wanfang Data, and VIP. Given the notable increase in research on medication adherence in recent years, the search period was limited to studies published between January 1, 2010, and November 30, 2024. To ensure comprehensiveness and representativeness, additional articles were identified by screening the reference lists of the included studies.

Search terms in Chinese included: “用药依从性” (medication adherence), “慢性病” (chronic disease), “用药行为” (medication behavior), and “影响因素/决定因素” (influencing/determinant factors), along with their synonyms. English search terms included “chronic,” “compliance,” “medication,” and “determinant factors,” combined using Boolean operators to formulate the search strategies.

Inclusion and exclusion criteria

Inclusion criteria: (1)Published in either Chinese or English; (2)Descriptive studies, analytical studies, or literature reviews; (3)Explicitly addressed patients with chronic diseases, medication adherence, and influencing factors.

Exclusion criteria: (1)Publications in languages other than Chinese or English; (2)News articles, commentaries, editorials, or conference abstracts; (3)incomplete titles or abstracts; (4)did not align with the objectives of this review; (4)involving chronic disease patients under the age of 18.

Methodology

The COM-B model offers a structured framework for analyzing behavioral determinants, encompassing three core dimensions: capacity, opportunity, and motivation. It facilitates the integration of diverse factors influencing medication adherence among patients with chronic diseases.

As a comprehensive theoretical model, COM-B is designed to narrow the scope of potential interventions by identifying those most likely to effect behavior change. It is widely applied across fields such as rehabilitation, health promotion, and public health, where it supports the development of evidence-based, theory-driven behavioral interventions.[3]

Compared with the World Health Organization’s five-category classification of medication adherence determinants—sociodemographic, patient-related, disease-related, therapy-related, and healthcare system-related—the COM-B model groups these factors into three overarching dimensions. These are further categorized into sub-dimensions, offering a more nuanced and systematic analytical framework. Rooted in behavior change theory, the COM-B model also emphasizes the dynamic interplay among factors, enhancing the coherence of behavioral analyses.

This review adopts the COM-B model to systematically analyze the barriers to and facilitators of medication adherence among patients with chronic diseases across capacity, opportunity, and motivation.[6] Capacity refers to an individual’s physical and psychological ability to perform a target behavior. Physical capacity includes elements such as functional status and physical skills necessary to carry out the behavior.

Psychological capacity involves cognitive processes such as knowledge, reasoning, memory, and habits that support the execution of the behavior. Opportunity encompasses external factors that facilitate or hinder behavior but are outside the individual’s direct control, physical opportunity includes resources such as time, medication availability, and access to healthcare services, social opportunity refers to influences from the social environment, including social norms, peer support, and expectations from family or caregivers. Motivation includes the internal processes that activate and guide behavior. Reflective motivation involves conscious evaluation, planning, and goal-setting enhanced through learning. Automatic motivation refers to emotional responses, impulses, and habits shaped by associative learning and affective experiences (see Fig. 1).

Based on the COM-B model, we developed a conceptual coding framework for classifying the determinants of medication adherence. Relevant influencing factors were extracted from the selected literature and systematically mapped to the three COM-B dimensions. Coding rules were established according to the model’s definitions and subcategory criteria. Two researchers independently coded the extracted data, discussed discrepancies to reach consensus, and documented all coding decisions and deliberations through coding records and analytical memos.

Results

Overview of the literature on factors influencing medication adherence in patients with chronic diseases

A total of 21,163 articles were retrieved. After removing duplicates and conducting two rounds of screening, 79 studies were ultimately included in this review (51 published in English and 28 in Chinese) (Fig. 2).

The number of publications increased significantly after 2018, with a steady upward trend by year, reaching highest volume of publications in 2022.

Among the included studies, 6 focused solely on capacity-related factors, 9 on opportunity-related factors, and 16 on motivation-related factors, the remaining 48 studies addressed two or more dimensions of the COM-B model. The majority of studies employed quantitative and qualitative research methods, including questionnaire surveys, in-depth

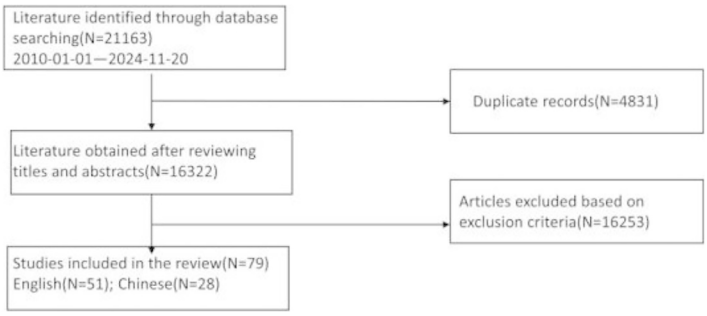

Fig. 2. Literature screening flowchart.

Table 1
Factors influencing medication adherence in patients with chronic diseases.

COM-B model	Specific factors	Descriptions
Capacity factor	Physical capacity factor	Physical fitness
		Physical functioning
		Memory
	Psychological capacity factor	Emotional state
		Medication-taking habits
		Lifestyle
		Mental health status
Opportunity factor	Physical opportunity factor	Accessibility of medications
		Availability of medical resources
		Equipment and technical support
	Social opportunity factor	Social support and group interaction
		Socio-cultural norms
		Patient's financial status
Motivation factor	Reflective motivation factor	Self-efficacy
		Health literacy
		Disease perception
	Automatic motivation factor	Medication belief
		Health goals and expectations

interviews, observational studies, intervention studies, and randomized controlled trials (Table 1).

Research on capacity-related factors is well developed across various countries. In contrast, studies focusing on opportunity and motivation related factors concentrate in Asia, the Americas, and parts of Africa such as Ethiopia.

Capacity-related factors

Physical capacity is a significant determinant of medication adherence. Most studies indicate that adherence is closely related to patients' physical condition, motor abilities, and memory function.

Specifically, age-related physical decline was shown to hinder patients from taking medications on schedule, thereby weakening adherence.[7] Shahabi N and Wu et al[8,9] found that visual impairments and a history of smoking were negatively associated with adherence behaviors. Li et al[10] further reported that patients suffering from comorbid conditions, chronic pain, insomnia, sensory decline (e.g., hearing and vision loss), and cognitive impairments (e.g., poor memory, reduced attention, or diminished comprehension) often experience difficulty in following prescribed medication regimens. The impact of gender on medication adherence remains inconclusive. While some studies have found that female patients exhibit lower adherence compared to males,[11,12] other studies report no statistically significant gender-based differences. These inconsistencies may be attributable to variations in disease types, sociocultural contexts, and health beliefs.

Psychological capacity also plays a crucial role in shaping medication adherence. Key influencing factors include emotional state, medication-taking habits, lifestyle behaviors, and overall mental health. Previous studies showed association of low adherence with polypharmacy, anxiety, and negative attitudes toward treatment.[13–15] In addition, unhealthy lifestyle patterns—such as irregular eating habits—were identified as contributing factors to poor adherence.[16] However, findings regarding the influence of medication-taking habits remain mixed. Some studies suggest longer duration of illness can develop stable and effective medication routines, which may serve as protective factors for adherence.[17–19] Conversely, other studies point to the phenomenon of "treatment fatigue," wherein long-term medication use leads to reduced motivation and declining adherence over time.[20] Furthermore, patients who develop preferences or dependence on specific medications may experience stress or uncertainty when required to change prescriptions. This emotional response can negatively affect their willingness to adhere to new medications.[17] However, the extent of this impact varies across different diseases and treatment regimens and warrants further investigation.

Opportunity-related factors

Physical opportunity related factors, such as medication accessibility, availability of healthcare services, drug packaging, and technological support, were consistently identified as significant determinants of medication adherence. Studies identified medication shortages, limited access to pharmacies or healthcare providers, and infrequent clinical visits as barriers of medication adherence. Patient dissatisfaction with physicians or the healthcare system also contributes to poor adherence.[19,21] Innovations in drug packaging, such as multi-dose blister packs, have been associated with fewer missed doses and improved adherence to daily regimens.[22,23] With the advancement of digital health technologies, tools such as smart pillboxes, electronic reminders, and remote monitoring devices become increasingly effective in prompting patients to take their medications on time, thereby reducing unintentional nonadherence.[22,24] While these technological interventions are generally beneficial, their usability may differ across populations. For example, varying levels of digital literacy and device complexity between younger and older caused differences, which warrants further investigation.

Social opportunity-related factors received more attention in the literature. Main factors include social support, interpersonal interactions, sociocultural norms, and financial conditions. A large number of studies confirmed that support from family members and healthcare providers can positively influence medication adherence. In contrast, poor economic status is associated with reduced access to medications, leading to poor adherence. Studies found that patients living alone or lacking medication guidance are more likely to demonstrate nonadherence.[8,15,19] Similarly, Chinese studies indicate that emotional and instrumental support from family members can significantly enhance adherence behaviors.[25,26] In addition to family support, healthcare providers play an essential role in promoting appropriate medication use. The previous study found that the type of healthcare facility where patients first seek care may influence the quality of medication counseling received.[27] Moreover, clear and consistent instructions from

medical professionals were shown to correlate strongly with improved adherence.[28]

Economic barriers also remain a critical concern. Numerous studies reported that patients with limited financial resources are more likely to abandon expensive but clinically effective medications, resulting in poor long-term adherence.[12,29] Payment methods, health insurance coverage, and reimbursement rates were all identified as influencing factors.[30] Supporting this, Hung et al[31] demonstrated that pharmaceutical financial assistance programs significantly improve adherence among financially disadvantaged patients.

Motivation-related factors

Reflective motivation-related factors, such as self-efficacy, health literacy, and illness perception—play a crucial role in determining medication adherence among patients with chronic diseases.

Self-efficacy refers to an individual's belief in their ability to successfully execute a specific behavior. Numerous studies, both domestic and international, have shown that patients with low self-efficacy are more likely to exhibit poor adherence, identifying self-efficacy as a significant predictor of medication adherence.[20,37]

Health literacy is another key factor influencing adherence. Structured health education and clear medication guidance—delivered during clinical consultations, at discharge, or through follow-up—can enhance patients' understanding of their illness and prescribed treatment, thereby improving adherence. This relationship has been consistently supported by findings across different healthcare systems.[7,29,32]

Illness perception, or how patients cognitively and emotionally perceive their condition, has been identified as a critical determinant of both psychological adjustment and adherence behaviors. Studies have reported a positive association between stronger illness perception and self-management behaviors among patients with chronic diseases.[21,32]

In addition, media exposure has emerged as a potentially disruptive influence. The widespread dissemination of misleading health-related information through television, smartphones, and online platforms may lead some patients to self-medicate or disregard professional medical advice, undermining appropriate medication adherence.[33] However, the magnitude of this effect remains debated. Individual differences in media literacy, interpretation, and behavioral response suggest that further research is needed to clarify these mechanisms.

Automatic motivation factors also contribute significantly to medication adherence. Positive beliefs about medication necessity, clearly defined health goals, and high treatment expectations can enhance adherence, while negative attitudes, uncertainty about efficacy, and perceived stigma may reduce it. Patients who believe in the benefits of medication and have experienced improvements in their condition are more likely to adhere to prescribed regimens.[34–36]

Crutzen et al[17] identified several negative beliefs that interfere with adherence, including associating medication use with disease-related stigma. Concerns about side effects, fear of disease progression, and financial burden were also found to trigger behaviors such as dose skipping or intentional modification of prescribed regimens.

Additionally, studies have shown that patients' adherence is strengthened when they or people around them have had positive experiences with similar medications, or when they place strong trust in their healthcare providers.[37–39] Conversely, negative emotional states and adverse medication experiences within the patient's social circle may discourage adherence.

The relationship between *self-rated health status* and medication adherence remains inconclusive. Some studies report that patients who perceive their health as better than peers may exhibit lower adherence, possibly due to a reduced perceived need for medication.[40] In contrast, other studies suggest that patients with higher self-rated health adhere better, motivated by their belief in treatment efficacy.[17,41,42] These contradictory findings suggest that the association between self-perceived health and medication adherence is not strictly linear and warrants further investigation to uncover the underlying mechanisms and contextual variables.

Discussion

With the growing emphasis on chronic disease management, research on medication adherence has undergone significant evolution in both scope and methodology. Earlier studies tended to focus on isolated factors, while more recent work has begun to explore the complex interactions and mechanisms that shape adherence behaviors. This discussion synthesizes key trends in the literature along three primary dimensions: the expansion of research perspectives, the shift in methodological approaches, and the increasing focus on the mechanisms and interrelationships among influencing factors—particularly as conceptualized through the COM-B model.

From unidimensional to multidimensional research perspectives

Between 2010 and 2012, research on medication adherence among patients with chronic diseases primarily focused on capacity-related factors, especially sociodemographic and psychological characteristics such as age, gender, educational level, and cultural background. These early studies were largely unidimensional, aiming to identify statistically significant associations.

Over time, scholars have come to recognize that medication adherence is a complex behavior influenced by a multidimensional network of internal and external determinants. As a result, more recent studies have incorporated motivational factors (e.g., health education, patient attitudes toward treatment, perceived treatment efficacy) and opportunity-related factors (e.g., healthcare environment, availability of social support, sociocultural norms, and economic conditions).

This broadening of perspective reflects a more holistic understanding of medication adherence and has enhanced our ability to identify both barriers and facilitators. By accounting for multiple, interacting dimensions, researchers are better positioned to develop tailored interventions that address the complex realities faced by patients managing chronic conditions.

From observational to interventional research approaches

In parallel with the expansion of research perspectives, methodological approaches have shifted from observational to more interventional designs. Observational studies have played a critical role in identifying correlations between potential determinants and adherence behaviors. However, these studies are limited in their ability to establish causality.

Interventional studies, in contrast, are designed to actively manipulate specific variables—such as through patient education programs, behavioral interventions, or medication management tools—and then assess changes in adherence outcomes. These approaches are particularly effective when targeting motivational factors, which are more amenable to change than structural or demographic variables.

This methodological shift has allowed researchers not only to test hypotheses derived from observational studies but also to generate actionable strategies for improving adherence. Moreover, interventional research provides a stronger evidence base for the development of personalized adherence-enhancing programs tailored to patient needs.

Increasing focus on mechanisms and interrelationships among influencing factors

Recent studies have increasingly turned their attention to the mechanisms of influence and interrelationships among capacity, opportunity, and motivation. This reflects a deeper understanding that medication adherence is not merely the outcome of isolated factors but rather the result of dynamic, reciprocal interactions between patient capabilities, environmental context, and psychological processes.

Capacity factors—such as cognitive functioning, memory, and comprehension—serve as foundational enablers for adherence. A patient's ability to understand and follow treatment instructions is directly tied to their capacity. Deficits in this domain, such as cognitive decline or lack of agreement with the treatment plan, are often cited as root causes of poor adherence.

Opportunity factors, including access to healthcare services and social support systems, also have a direct impact on adherence. Patients who lack equitable access to care or are socially isolated are more likely to experience difficulty in maintaining consistent medication routines.

Motivational factors represent the most dynamic and context-sensitive dimension. These factors are shaped by patients' beliefs, emotional responses, and cultural values, and they play a pivotal role in initiating and sustaining medication adherence. Motivation is also highly susceptible to change and thus represents a critical target for intervention.

Importantly, emerging evidence supports a mediated model in which capacity and opportunity influence adherence both directly and indirectly via motivation. Several studies have identified motivation as a mediating factor between external context and behavioral outcomes.[7,9,21–23,33] This highlights the importance of targeting motivational constructs—such as treatment beliefs, self-efficacy, and perceived benefits of therapy—in efforts to improve adherence.

Interventions that strengthen motivation can, to some extent, compensate for limitations in capacity and opportunity, thereby enhancing adherence outcomes. Such strategies may include personalized counseling, digital health tools, or peer support programs—each designed to reinforce positive behavioral patterns in patients with chronic diseases.

Future directions for research

Previous research on medication adherence among patients with chronic diseases has exhibited several notable limitations:

1. Study populations have predominantly focused on older adults, rural residents, and hospitalized patients, with limited attention to individuals across different age groups, treatment phases, or those managing chronic diseases at home.[3–5,10,17]
2. Many studies have assessed only a single aspect of medication adherence—such as dosage accuracy, timing compliance, or route of administration—failing to capture the full complexity of adherence behaviors.[5,9,18–21]
3. Existing findings have largely been based on correlation-based analyses that identify independent factors, while the mechanisms underlying these relationships and the interactions among influencing variables remain insufficiently explored.[15,22,32–34]

Future research should aim to broaden the scope of study populations to include patients at different stages of disease progression and across various care settings. Special attention should be paid to patients managing chronic conditions at home, who often face specific behavioral and contextual barriers to adherence due to the lack of supervision and structured healthcare support.

In addition, future studies should examine the **combined and interactive effects** of multiple influencing factors, with a particular focus on the **interplay among capacity, opportunity, and motivation**, as conceptualized in the COM-B model.

Finally, most current studies rely heavily on **self-reported measures** of adherence, which are prone to **recall bias and social desirability bias**, potentially compromising data validity. To enhance the accuracy and objectivity of adherence assessment, future research should consider integrating additional measurement methods—such as **pill counts, electronic monitoring devices, or digital adherence tracking tools**—to triangulate self-reported data and provide a more robust evaluation of medication adherence behaviors.

Conclusion

Medication adherence among patients with chronic diseases is a complex behavior influenced by an interplay of **capacity**, **opportunity**, and **motivation** factors, as conceptualized in the COM-B model. Capacity-related factors** include both physical and psychological components. Physical capacity refers to functional abilities such as physical fitness, motor skills, and memory. Psychological capacity encompasses emotional status, medication-taking habits, lifestyle behaviors, and overall mental health. Opportunity-related factors** comprise both physical and social elements. Physical opportunity involves the accessibility of medications, availability of healthcare services, and support through medical devices or digital technologies. Social opportunity includes family and peer support, sociocultural norms, and patients' financial circumstances. Motivational factors** include both reflective and automatic components. Reflective motivation relates to self-efficacy, health literacy, and illness perception, while automatic motivation involves medication beliefs, treatment expectations, and health-related goals. Understanding these **multidimensional and interacting influences is essential for the development of **personalized, theory-driven interventions aimed at improving medication adherence in chronic disease populations.

Declarations

Not applicable.

Authors' contributions

Conceptualization, Z.J.; Methodology, Z.J.; Data curation, Z.J.; Formal analysis, Z.J.; Funding acquisition, not applicable; Project administration, not applicable; Resources, not applicable; Supervision, D.T.; Validation, H.J. and Z.Y.; Writing—original draft, Z.J.; Writing—review and editing, H.J. and Z.Y. All authors have read and agreed to the published version of the manuscript.

Ethical approval and consent to participate

Not applicable.

Consent for publication

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Declaration of competing interest

All authors declare that there are no competing interests.

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