

Determinants of Adherence to Taking Antihypertensive Drugs Based on the Health Promotiom Model (HPM); A Systematic Scoping Review

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Kata Kunci: Hipertensi, Kepatuhan Minum Obat, Health Promotion Model, Scoping Review	Kepatuhan dalam mengonsumsi obat antihipertensi merupakan faktor kunci keberhasilan pengendalian tekanan darah dan pencegahan komplikasi kardiovaskular. Namun, berbagai bukti empiris menunjukkan bahwa tingkat kepatuhan pasien hipertensi masih belum optimal. Oleh karena itu, diperlukan pendekatan berbasis kerangka teori yang komprehensif untuk memahami faktor-faktor yang memengaruhi perilaku kepatuhan secara mendalam. Studi ini bertujuan untuk memetakan dan mensintesis bukti ilmiah terkait faktor-faktor yang memengaruhi kepatuhan minum obat antihipertensi berdasarkan kerangka <i>Health Promotion Model</i> (HPM). Penelitian ini menggunakan desain <i>systematic scoping review</i> dengan mengacu pada pedoman <i>Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Scoping Reviews</i> (PRISMA-ScR). Artikel yang dipublikasikan pada periode 2020–2025 diseleksi secara sistematis berdasarkan kriteria inklusi dan eksklusi yang telah ditetapkan. Hasil kajian menunjukkan bahwa konstruk utama HPM yang berhubungan signifikan dengan kepatuhan minum obat antihipertensi meliputi <i>perceived benefits</i> , <i>self-efficacy</i> , <i>perceived barriers</i> , serta pengaruh interpersonal. Di antara konstruk tersebut, <i>perceived benefits</i> dan <i>self-efficacy</i> merupakan determinan yang paling konsisten dilaporkan. <i>Health Promotion Model</i> merupakan kerangka teoritis yang relevan dan aplikatif dalam memahami serta meningkatkan kepatuhan minum obat antihipertensi melalui intervensi keperawatan promotif dan preventif.
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Date received: 09 February 2026	<i>Adherence to antihypertensive medication is a key determinant of successful blood pressure control and the prevention of cardiovascular complications. However, empirical evidence indicates that medication adherence among patients with hypertension remains suboptimal. Therefore, a comprehensive and theory-based approach is required to better understand the factors influencing adherence behavior. This study aimed to map and synthesize scientific evidence on factors influencing adherence to antihypertensive medication based on the Health Promotion Model (HPM). This study employed a systematic scoping review design following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Scoping Reviews (PRISMA-ScR) guidelines. Relevant articles published between 2020 and 2025 were systematically selected according to predefined inclusion and exclusion criteria. The findings revealed that key HPM constructs significantly associated with adherence to antihypertensive medication included perceived benefits, self-efficacy, perceived barriers, and interpersonal influences. Among these constructs, perceived benefits and self-efficacy were the most consistently and strongly reported determinants across the reviewed studies. The Health Promotion Model is a relevant and applicable theoretical framework for understanding and improving adherence to antihypertensive medication through promotive and preventive nursing interventions.</i>
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Introduction

Hypertension or high blood pressure is one of the non-communicable diseases (*non-communicable diseases*) which has a high prevalence worldwide and is a major risk factor for various cardiovascular diseases such as *stroke*, *infark miokard*, heart failure, and chronic kidney disease. The World Health Organization (WHO) reports that hypertension affects more than one billion people worldwide and is responsible for millions of deaths each year. This condition is often referred to as '*silent killer*' because they often do not show obvious symptoms until serious complications occur (WHO, 2023). At the national level, data from the Ministry of Health in 2024 shows that the prevalence of hypertension in Indonesia has increased significantly from 25.8% in 2013 to 34.1%, reflecting the increasing burden of hypertension as a public health problem (Ministry of Health, 2023). Globally, hypertension is still a significant cause of premature death and demands effective long-term management (Arifin et al., 2022). Effective management of hypertension requires a comprehensive approach that includes lifestyle modification and long-term pharmacological therapy. Adherence to an antihypertensive treatment regimen is key to success in controlling blood pressure and preventing life-threatening complications. However, various epidemiological studies show that the rate of non-adherence to antihypertensive treatment is still very high. Research (Goudarzi et al., 2020) It shows that the level of adherence to treatment is still low in various countries, which has an impact on the high rate of complications and the economic burden of health. According to global data, only about 50-60% of hypertension patients adhere to their treatment regimen, with lower rates in developing countries. This non-compliance contributes significantly to therapy failure, increased *morbidity* and *cardiovascular mortality*, as well as the increasing economic burden of the health system (Pan et al., 2023)

Previous studies have identified that adherence to taking antihypertensive medications is influenced by very complex and multidimensional factors. These factors are not only limited to clinical and pharmacological aspects, but also include psychological, social, economic, and cultural dimensions. Study (Win et al., 2021) In a systematic review they identified more than 20 different factors that affect antihypertensive drug adherence, ranging from demographic characteristics, disease-related factors, complexity of drug regimens, to psychosocial and health system aspects. The results of the study conducted in Cimahi Indonesia showed a significant

relationship between disease risk perception and adherence to treatment (Suhat et al., 2022). Patients who understand the risk of hypertension complications tend to be more disciplined in taking drugs as recommended by doctors. The complexity of these factors suggests that approaches to improving compliance cannot be one-size-fits-all, but rather must be tailored to local contexts and specific population characteristics. Therefore, a theoretical framework is needed that is able to integrate the various dimensions of factors that affect health behavior holistically.

The analysis shows that non-adherence to antihypertensive therapy is influenced by various interrelated barriers, including patient factors, therapy, medical conditions, socio-economic, and health systems. Patient factors include low knowledge, health literacy, and motivation. Therapeutic factors are related to drug side effects as well as the instability of drug availability. Factors of medical conditions include the presence of comorbidities and the nature of hypertension which is often asymptomatic. Socioeconomic factors are characterized by low income and education levels, while health system factors include limited communication between patients and health workers as well as access to primary services that are not optimal. The complexity of these barriers confirms that improving medication adherence requires a holistic approach that considers individual, social, cultural, and health care system aspects in an integrated manner (Febriyanti et al., 2025). Wagiu et al., (2025) showed a significant relationship between the level of adherence to the use of antihypertensive drugs and the quality of life of hypertensive patients ($p < 0.05$). These findings indicate that the higher the level of adherence in taking medications, the better the quality of life of hypertensive patients. *Health promotion model* (HPM) developed by Nola J. Pender is one of the comprehensive theoretical models and has been widely used in health behavioral research.

This model emphasizes the important role of the individual's previous experiences, specific cognition and affections related to behaviors, as well as interpersonal and situational factors in shaping health behaviors, including adherence to treatment. This theory explains that a person's health behavior is influenced by three main components, namely individual characteristics, perceptions of benefits and barriers, and interpersonal and situational influences (Pender, 2021). This model places the individual as an active agent in regulating his or her

health behavior based on motivations, beliefs, and previous experiences. HPM focuses on promotive and preventive aspects, which are in line with the modern public health paradigm that prioritizes disease prevention and optimal health promotion (Goudarzi et al., 2020).

In the context of adherence to taking antihypertensive medications, each of these constructs can provide important insights into why some patients are adherent to treatment while others are not. Pender, (2021) explains that this model integrates constructs from various theories of psychology and behavior, including value expectation theory, social cognitive theory, and the concept of self-efficacy. The HPM framework consists of seven key components that interact with each other: the individual's previous experiences and characteristics, the perception of the benefits of the action, the perception of resistance to action, the perception of self-efficacy, interpersonal influence, situational influence, and commitment to the plan of action. The comprehensiveness of this model makes it particularly relevant for understanding multi-faceted treatment adherence behavior. Method *literature review* from various research results conducted by Supriati, (2019) Examine community-based hypertension prevention and control efforts and the implementation of non-communicable disease programs. The results of the study confirm that the success of hypertension prevention and control programs is highly dependent on effective collaboration between health workers and trained health cadres, especially in blood pressure measurement, health condition monitoring, and education on healthy lifestyle changes to prevent hypertension at the community level.

Although adherence to taking antihypertensive drugs has been extensively researched, existing studies still show conceptual fragmentation. Most previous studies have applied health behavioral theory partially by focusing on specific constructs, such as benefit perception, barrier perception, or self-efficacy, without integrating the overall structure of the *health promotion model*. As a result, the dynamic relationship between cognitive, affective, interpersonal, and situational factors in shaping compliance behaviors has not been comprehensively explained. Empirically, the available literature is still dominated by observational studies with cross-sectional designs as well as the use of theoretical models oriented towards the perception of disease threats. Evidence synthesis that explicitly maps the determinants of adherence to taking antihypertensive drugs based on the entire construct of *the health promotion model*, especially

through the integration of quantitative and qualitative findings, is still limited. This condition indicates the need for a systematic theory-based study to identify consistent patterns of findings, under-researched areas, and implications for promoting nursing practice.

The novelty of this research lies in a theory-based synthesis that systematically maps the compliance factors of taking antihypertensive drugs using the entire construct of *the health promotion model* as the main conceptual framework. This approach allows for a more complete understanding of the determinants of compliance behavior in the perspective of nursing health promotion. In addition, the study integrates empirical evidence from cross-contextual quantitative and qualitative studies, resulting in a comprehensive conceptual mapping while identifying research gaps relevant to the development of health promotion-based nursing interventions. This study aims to map and synthesize factors that affect adherence to taking antihypertensive drugs based on *the construct of a health promotion model*. In particular, this study aims to; Identify constructs of *health promotion models* related to adherence to taking antihypertensive medications, determine the most consistent determinants of adherence reported in the literature, identify empirical gaps in the application of *health promotion models* in adherence studies of taking antihypertensive medications. Adherence to taking antihypertensive medications is a long-term health behavior that demands the active involvement of the individual in the management of chronic diseases. *The health promotion model is relevant* because it places the individual as an active agent whose health behavior is influenced by cognitive and affective processes, as well as by interpersonal and situational influences.

The synthesis of evidence based on *the health promotion model* provides a strong scientific basis for nursing practice in designing promotive and preventive interventions that focus on improving the perception of benefits, strengthening self-efficacy, and optimizing social support. Thus, this research contributes to the development of professional nursing science and is in line with the demands of international scientific publications emphasizing a theory and evidence-based approach. Although *the health promotion model* has been used in various studies related to health behaviors in hypertensive patients, there have not been many literature reviews that systematically map and synthesize the adherence factors of taking antihypertensive drugs based on this model framework. This kind of systematic review is important to identify

consistent patterns of research findings, identify gaps in the literature, and provide evidence-based recommendations for the development of more effective nursing interventions. Therefore, this *systematic scoping review* aims to identify, map, and synthesize the latest scientific evidence regarding factors that affect adherence to taking antihypertensive drugs based on *the health promotion model*. The results of *this scoping review* are expected to make a significant contribution to the development of more holistic and theory-based nursing intervention strategies to improve hypertension patients' adherence to their treatment. With a deeper understanding of the factors that affect compliance, healthcare workers, especially nurses, can design a more personalized and effective approach in assisting hypertensive patients to achieve optimal blood pressure control and prevent serious cardiovascular complications.

Method

This study is a *systematic scoping review* designed to map and synthesize the scientific literature related to factors that affect adherence to antihypertensive medications. The *scoping review* methodology was chosen because of its exploratory nature and being able to identify key concepts, *gaps* in the literature, and the types of evidence available on a particular topic. The preparation of *this scoping review* follows the guidelines of *Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Scoping Reviews* (PRISMA-ScR) which is an international standard to ensure transparency, reproducibility, and methodological quality of systematic literature review. The research question that is the main focus of *this scoping review* is: What are the factors that affect adherence to taking antihypertensive drugs based on constructs in *the health promotion model*? This question is formulated to guide the systematic process of literature search and data extraction, as well as to ensure that the synthesis of the resulting evidence is relevant to the theoretical framework used. The formulation of research questions and inclusion criteria in *this scoping review* was prepared using the PICOS (*Population, Intervention/Interest, Comparison, Outcome, Study design*) framework as presented in the following table:

Table 1. PICOS

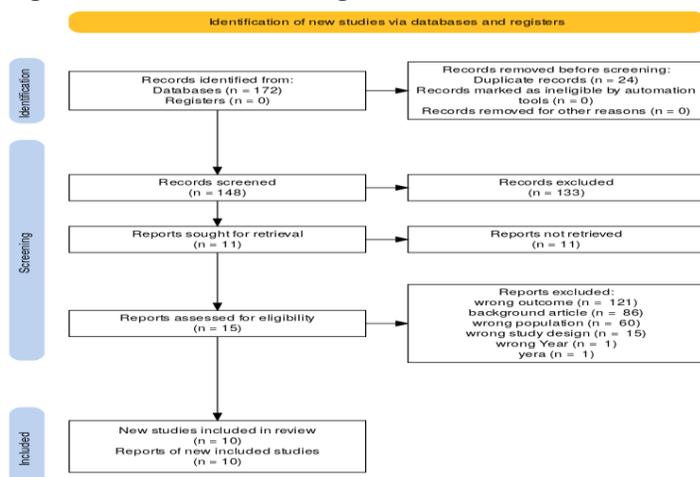
Population (P)	The community or adult and elderly patients diagnosed with hypertension.
Intervention/Interest (I)	Behavioral, psychosocial, and environmental factors related to adherence

	to taking antihypertensive medications based on the Health Promotion Model.
Comparison (C)	There was no specific comparison group, given that the purpose of the scoping review was to map the available evidence.
Outcome (O)	Adherence to taking antihypertensive drugs and the determinants that affect them
Study Design (S)	Quantitative (cross-sectional, observational) research and relevant qualitative research

Study Selection Process

The study selection process follows the standardized PRISMA-ScR flow. In the initial stage, all articles identified from various databases are collected and recorded in number. Then, duplicate removal is carried out using the automatic feature on Rayyan which is followed by manual verification to ensure that no articles are missed or incorrectly deleted. Once the duplication was removed, two *independent reviewers* screened by title and abstract to identify potentially relevant articles. Articles that pass the initial *screening* are then downloaded the full text and assessed in detail against the inclusion and exclusion criteria. Assessments are conducted independently by two *reviewers*, and in case of disagreement, discussions are conducted to reach consensus or involve a third *reviewer* if necessary. This process ensures objectivity and reliability in article selection. Articles that meet all inclusion criteria are then included in the data extraction and synthesis stage. The study selection flow is documented in the PRISMA diagram to provide transparency about the number of articles at each stage and the reasons for exclusion.

Figure 1 : Prism Flow Diagram



Research Results

Study Characteristics

The results of the search and literature selection identified a number of studies from various countries with diverse geographical, cultural, and health system contexts, including Iran, China, Thailand, Indonesia, and the United States. This geographic diversity provides a broader perspective on the universality and variability of the factors that affect compliance. In terms of research design, a quantitative approach with a cross-sectional design and a qualitative approach was used to explore an in-depth understanding of patients' perspectives and experiences related to medication adherence. Qualitative studies provide rich context on how HPM constructs are perceived and experienced by patients in their daily lives (Gorbani et al., 2020). Rojas-Torres et al., (2025) describes general health behaviors (lifestyle), showing that nursing interventions based on the Pender model result in statistically significant improvements on various dimensions of healthy behaviors.

Thematic Synthesis Based on *Health Promotion Model*

The synthesis of findings from the studies studied is organized based on the main constructs in the *health promotion model*; *Perceived Benefits*. The perception of the benefits of antihypertensive treatment emerged as one of the most powerful and consistent determinants in shaping medication adherence behavior. These findings were particularly prominent in the elderly group, where benefit perception was the most powerful predictor of compliance behavior. Widayani et al., (2024) In his study, he found that *perceived benefit* is the strongest determinant factor in medication adherence in elderly patients with hypertension. Elderly patients who understand that medication can help them maintain independence, reduce the risk of complications that can limit their activities, and prolong life expectancy with good quality, tend to be more adherent to their treatment regimen.

At the individual level, the patient's low knowledge, motivation, and self-efficacy contribute to medication noncompliance. This condition reflects the construct *perceived barriers* and *self-efficacy* in HPM, where individuals with limited understanding of treatment benefits and low self-confidence are likely to be inconsistent in running therapy regimens. These findings are in line with research (Ratnasari & Dwigita, 2020) who reported that self-efficacy was significantly related to the ability of hypertensive patients to manage treatment independently. *perceived benefit* which is felt to be the strongest determinant of medication

adherence among the elderly with hypertension. Respondents with high confidence in perceived benefits were 12,061 times more likely to adhere to treatment than respondents with low confidence in perceived benefits (Widayani et al., 2024).

Perceived Barriers

Patient-perceived barriers are another significant factor that affects adherence to taking antihypertensive medications, and often contributes to non-compliance. These barriers can be physical, psychological, social, or economic. Therapeutic saturation or *medication fatigue* It is also a significant barrier, especially in patients who have taken the drug for a long period of time. A daily routine of taking medication without any perceived symptoms can cause patients to lose motivation and question the need to continue treatment. Gibran et al., (2021) In its qualitative study, it was identified that barriers such as drug side effects and therapy saturation contributed significantly to the non-compliance of hypertensive patients in outpatient facilities. Efliani & Desniati, (2025) explained that most respondents showed a low level of health trust, which is in line with low adherence in taking antihypertensive drugs, which is 85%. Statistical analysis showed a significant relationship between health trust and medication adherence in hypertensive patients at the Tembilahan Hulu Health Center ($p = 0.003$). These findings indicate that increased public trust in health services and medical information is an important factor in improving medication adherence. Therefore, efforts are needed to strengthen the quality of health services and communication by the Health Center to increase patient trust and a better understanding of hypertension management.

Self-Efficacy

Self-efficacy or patients' confidence in their ability to effectively manage treatment is a very important psychological construct in determining adherence. Patients with high *self-efficacy* believe that they are able to integrate medication routines into their daily lives, overcome emerging barriers, and maintain adherence in the long term. In contrast, patients with low *self-efficacy* tend to feel overwhelmed and pessimistic about their ability to adhere to a treatment regimen. Various studies show a significant relationship between *self-efficacy* with blood pressure control and therapeutic compliance levels. Gorbani et al., (2020) reports that *self-efficacy* is a strong predictor of hypertension control behavior and medication adherence in hypertensive patients in Iran. Patients who have strong self-confidence about their ability to

manage their health conditions are more proactive in seeking information, consulting with healthcare professionals when experiencing problems, and finding strategies to integrate medication into their daily routine. Approach *self management education* (SME), based on the HPM principle, involves patient empowerment and behavioral strategies, showing significant effects on hypertensive patients (Sakinah et al., 2024).

Interpersonal Influence

The interpersonal influence of the patient's social environment, especially the support of family and health workers, plays a very important role as a reinforcement of adherence to taking antihypertensive drugs. Social support can take the form of emotional support (such as empathy, attention, and encouragement), instrumental support (such as assistance in procuring medication or reminding medication schedules), informational support (such as sharing information and experiences), and assessment support (such as positive feedback about the patient's efforts in managing their condition). Family, especially spouses and children, are often the main source of support for hypertensive patients. Family members who are actively involved in medication management, such as reminding medication schedules, accompanying patients to health care, and providing emotional support, can significantly improve adherence. Kongsu et al., (2024) in their qualitative study in Bangkok identified that family and health worker support is an important factor that plays a role as a compliance booster, particularly in elderly patients who may experience a decline in cognitive or physical function. Findings Jeemon & Chacko, (2020) Good family support for self-care (OR: 1.9, 95% CI: 1.1-3.1) correlates with optimal blood pressure control. Family support and adherence levels to self-care activities have been shown to be related to blood pressure control.

The compliance of hypertension patients in the management of treatment is influenced by individual factors in the form of motivation, acceptance of the disease, self-efficacy in implementing a healthy lifestyle, and consistency of monitoring and follow-up of treatment. Family support acts as an interpersonal reinforcement through monitoring drug consumption and emotional support, while at the system level, the availability of affordable medications, comprehensive health services, access to health insurance, and ongoing education programs are situational factors that determine the sustainability of medication adherence (Ghaderi Nasab et al., 2024). High motivation is closely related to better levels of adherence in taking

antihypertensive medications. These findings demonstrate the need for an active and sustainable role of health workers in maintaining and increasing patient motivation through education, mentoring, and a targeted promotive approach (Ahmad Abdul Ghofar Abdulloh & Veriyallia, 2025). Herwandi, (2025) The results showed that patients with good access to health services tended to have a higher level of adherence to taking antihypertensive drugs compared to patients with limited access. However, medication adherence is not only influenced by access to services, but also by individual motivation, family support, and quality of health services. These findings confirm that access to health services is an important factor, but it needs to be supported by personal and interpersonal factors to optimally improve the compliance of hypertension patients.

African-American groups with hypertension consistently exhibit lower rates of treatment adherence, which is not solely due to clinical factors, but also to social determinants and health beliefs that health care providers have not fully understood. These findings confirm the importance of a Health Belief Model (HBM)-based approach that considers individual perceptions, social experiences, and structural context in an effort to improve hypertension treatment adherence (Augusta et al., 2025). Most of the informants showed non-compliance in taking antihypertensive drugs regularly, which was influenced by low levels of knowledge about diseases and treatments, limited economic capabilities, low internal motivation, trust in alternative medicine, and lack of family support in supporting adherence to antihypertensive drug consumption (Aliyah Nurul & Krianto Tri, 2023).

Relevant HPM Constructs

In addition to the four main constructs that have been discussed, some studies have also identified the role of other HPM constructs in adherence to taking antihypertensive medications. *Activity-related affect*, or feelings and emotions experienced related to health behaviors, can affect compliance. Patients who experience positive emotions when performing health management activities tend to be more consistent in these behaviors. Commitment to a plan of action is also an important factor that mediates the relationship between cognition-affectation and actual obedience behavior. Patients who make explicit commitments, either to themselves or to healthcare workers or family, to comply with treatment tend to show higher levels of compliance. Strategies such as *action planning and coping planning* can help patients translate

intentions into concrete actions. Situational influences, such as the physical environment and social context in which the patient is located, can also facilitate or inhibit adherence. A conducive environment, such as easy access to health services, availability of medications, and *reminder systems* (such as alarms or apps *Smartphone*), can improve compliance. Conversely, an unsupportive environment can be a significant barrier. Community empowerment programs that focus on changing health behaviors and improving medication adherence have proven effective in lowering the burden of long-term health care costs (Zhang et al., 2018).

Discussion

The findings of this systematic scoping review provide comprehensive evidence that adherence to antihypertensive medication is a complex phenomenon and is the result of a dynamic interaction between cognitive, affective, interpersonal, and situational factors as described in the Health Promotion Model. This complexity underscores the importance of a holistic and multidimensional approach in understanding and addressing the problem of non-compliance, which cannot be solved through pharmacological or educational interventions alone.

The results of this scoping review directly answer the purpose of the study, which is to map and synthesize the factors that affect adherence to taking antihypertensive drugs based on the *construct of the health promotion model*. The findings suggest that several HPM constructs, particularly *perceived benefits*, *self-efficacy*, *perceived barriers*, and interpersonal influences, are consistently associated with adherence behaviors. Thus, the research objective of identifying the relevant constructs and dominant determinants of compliance has been systematically achieved. The dominance of the roles of *perceived benefits* and *self-efficacy* as the most consistent determinants reported in the literature indicates the importance of cognitive and psychological aspects in compliance behavior. These findings are in line with other theories of health behavior such as the *Health Belief Model* and *Social Cognitive Theory* which also emphasize the role of belief and *self-efficacy*. The implication is that nursing interventions should place a high priority on patient education that is not only informative but also transformative, capable of changing perceptions and boosting patients' self-confidence.

The dominance of the role of *perceived benefits* and *self-efficacy* indicates that adherence to taking antihypertensive drugs is more influenced by patients' belief in the benefits of

treatment and self-ability to manage the therapy regimen than by clinical factors alone. These findings confirm that compliance is a cognitive-affective behavior, where the patient's subjective perception and evaluation play an important role in long-term health decision-making. Meanwhile, *perceived barriers* function as an inhibiting factor that can neutralize the positive influence of benefit perception and self-efficacy. Barriers such as drug side effects, therapeutic saturation, and limited access to healthcare suggest that compliance cannot be detached from the context of the patient's life experience.

The role of *perceived barriers* in influencing compliance also needs serious attention in clinical practice. Identification of barriers requires comprehensive assessment and open communication. Nurses need to proactively inquire about side effects experienced, difficulties in accessing medication, financial problems, or other obstacles that patients may not spontaneously express for various reasons such as embarrassment, fear of criticism, or feeling that the issue is not important. Interpersonal influence, especially social support, is an aspect that is often underutilized in clinical practice. Family involvement in education and treatment planning can not only increase instrumental support (such as reminding medication schedules) but also emotional support that is essential for long-term motivation. *Family-focused interventions* that involve families in education, action planning, and monitoring sessions can significantly improve compliance.

The therapeutic relationship between patients and healthcare workers is also a crucial form of interpersonal support. *Continuity of care*, where patients meet with the same healthcare workers consistently, facilitates the formation of deep trust and rapport. In this context, nurses have a very strategic role because the frequency and duration of their interactions with patients are often greater than those of other healthcare professionals. The findings of this study are in line with the basic assumption of *the health promotion model* which emphasizes that health behaviors are influenced by the interaction between individual cognition-affectation and environmental factors. The consistency of findings related to *perceived benefits* and *self-efficacy* also supports the results of previous studies that place the two constructs as strong predictors of health behavior in chronic disease patients. In addition, the conformity of the findings with the previous literature strengthens the validity of *the health promotion model* as an applicable

conceptual framework in explaining adherence to taking antihypertensive drugs, especially in the context of promotive and preventive nursing.

The main scientific contribution of this study lies in the presentation of a conceptual synthesis that maps the compliance of taking antihypertensive drugs comprehensively based on the entire construct of *the health promotion model*. In contrast to previous research that was fragmentary, this study offers a unified understanding of the determinants of compliance from a nursing health promotion perspective. The results of this study enrich the treasure of nursing science by providing a strong theoretical basis for the development of health promotion model-based interventions, as well as opening up opportunities for the integration of this model in community and clinical nursing practice. Some constructs of the Health Promotion Model, such as *situational influences* and *commitment to plan of action*, were not always consistently reported in the studies studied. This inconsistency can be caused by variations in research designs, differences in measurement instruments, and diverse social contexts and health systems between countries. In addition, the limited focus of research on individual factors in most quantitative studies may lead to a lack of exploration of the role of situational and structural factors in shaping compliance.

This scoping review has several limitations that need to be considered in the interpretation of the findings. First, most of the included studies used cross-sectional designs, so the causal relationship between the factors in the *health promotion model* and adherence to taking antihypertensive drugs could not be definitively established. This design emphasizes more on associations than long-term behavior change mechanisms. Implications for future research include the need for intervention studies that explicitly use HPM as a framework for designing and evaluating compliance improvement programs. Studies that test the effectiveness of HPM-based interventions compared to usual care or other theory-based interventions may provide stronger evidence of the added value of this approach. In addition, research exploring mediation and moderation mechanisms in the relationship between HPM constructs and compliance can deepen theoretical and practical understanding (Abegaz et al., 2017).

In-depth qualitative research on the life experiences of patients with hypertension and their journey in achieving and maintaining compliance is also invaluable. These kinds of studies can uncover nuances and complexities that quantitative studies don't capture, and provide insight

into how HPM constructs are articulated and experienced in real-life contexts full of challenges and uncertainties. Finally, cultural adaptation and contextualization of HPM for a variety of different settings are also important research areas. Although the constructs in HPM appear universal, the way in which they are mediated and influenced by cultural, social, and health system factors can vary. Research that explores this variability and identifies best practices for a variety of contexts will be particularly beneficial for global implementation.

Conclusion

This scoping review shows that public compliance in taking antihypertensive drugs is influenced by various multidimensional factors that are in line with the main construct of *the health promotion model*. Individual factors, particularly *perceived benefits*, *self-efficacy*, and internal motivation, are the most consistent determinants contributing to medication adherence behavior in hypertensive patients. In addition, interpersonal factors such as family and health worker support, as well as situational factors including access to health services and previous experience with therapy, also play an important role in shaping adherence behaviors. The majority of included studies used observational and qualitative designs, which effectively map behavioral factors and patient perceptions, but are still limited in explaining the causal relationship and effectiveness of *health promotion model-based* interventions. Nonetheless, findings from a variety of country contexts show consistency that health promotion approaches that focus on individual empowerment and strengthening the perception of treatment benefits have the potential to improve adherence to antihypertensive therapy. Overall, the results of this scoping review confirm the relevance of the *health promotion model* as a comprehensive conceptual framework in understanding and developing strategies to improve adherence to antihypertensive medications. These findings can serve as a basis for the development of nursing interventions and health promotion programs oriented towards sustainable behavior change, particularly in the context of public health services and community nursing.

Implications of Nursing

The results of *this scoping review* have important implications for nursing practice, particularly in the management of hypertension patients in primary and community health services. The findings suggest that adherence to taking antihypertensive drugs is not only influenced by clinical factors, but also by individual behavioral, psychosocial, and perceptual

factors as described in the *health promotion model*. Therefore, nurses need to integrate a health promotion approach that focuses on patient empowerment in daily nursing care. In clinical practice, nurses have a strategic role in increasing patients' *perceived benefits* and *self-efficacy* towards antihypertensive therapy through health education that is structured, sustainable, and tailored to the patient's level of understanding. Education not only emphasizes adherence to medication regimens, but also links the benefits of treatment to the prevention of long-term complications and improved quality of life of patients. In the context of community nursing, nurses can act as facilitators of behavior change by involving the patient's family and social environment as a source of interpersonal support. This approach is in line with the interpersonal construct in *the health promotion model*, which emphasizes the importance of social support in maintaining adaptive health behaviors, including medication adherence.

In addition, the results *of this scoping review* confirm the need for nurses to conduct a comprehensive assessment of compliance barriers, both individual, social, and situational. This information can be used as a basis for the development of more personalized and contextual nursing care plans, as well as in the development of evidence-based nursing interventions that are relevant to the patient's condition. More broadly, these findings also have implications for nursing education and management. The integration of *health promotion models* in nursing education curricula and continuing training programs can strengthen nurses' competencies in designing effective health promotion interventions. At the managerial level, the results of *this scoping review* can be the basis for the formulation of nursing policies and programs that support the continuous improvement of therapeutic adherence in hypertensive patients.

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