

Barriers and Facilitators of Medication Adherence in Hypertension Patients: A Meta-Integration of Qualitative Research

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Abstract

The aim of this qualitative systematic review is to analyze the barriers and facilitators to the uptake of antihypertensive medication in hypertensive patients. The databases of PubMed, Embase, Web of Science, CINAHL, Cochrane Library, MEDLINE, China National Knowledge Infrastructure, Wanfang, VIP, and Chinese Biomedical were searched from inception to June 2023. The studies were screened, extracted, and assessed independently by two researchers. Previously, the researchers used the Joanna Briggs Institute Critical Appraisal Checklist for Qualitative Research to assess the quality of the included studies. A total of 27 studies were considered, resulting in two combined findings: a good level of knowledge, belief, and behavior and adequate social support were facilitators of medication adherence in hypertensive patients. In contrast, lack of medication literacy, difficulty adapting to roles, reduced sense of benefit from treatment, limited access to healthcare resources, and unintentional nonadherence were barriers. Medication adherence in hypertensive patients remains a challenge to be addressed. Future research should explore how complex interventions using a combination of evidence-based strategies and targeting multiple adherence behaviors (eg, long-term adherence to medication) are effective in improving medication adherence.

Keywords

hypertension, medication adherence, influencing factors, qualitative research, meta integration

Introduction

Hypertension (HTN) is a major risk factor for cardiovascular and cerebrovascular diseases, impacting various human organs such as the heart, brain, and kidneys. Globally, the prevalence of HTN is increasing. According to the World Health Organization, there are 1.4 billion people with HTN worldwide, of whom only 14% have their blood pressure under control.¹ There were 10.8 million deaths worldwide due to HTN in 2019.² Countries spend huge amounts of money on their healthcare systems every year to combat the negative effects of HTN.³ Controlling HTN is now a huge challenge for public health systems worldwide.

Medication adherence refers to the patient's voluntary cooperation in taking medication as prescribed, including the time, dose, and frequency of medication. Adherence to long-term corrective medication in HTN patients is an effective measure to control blood pressure and reduce the incidence of cardiovascular events.⁴ Nevertheless, maintaining a high level of adherence to antihypertensive therapy remains the most difficult challenge.⁵ Poor adherence to

medication is common among hypertensive patients worldwide, especially in countries in low- and middle-income regions.⁶ A meta-analysis involving 27 million patients showed that nonadherence to antihypertensive medication was common worldwide (27%–40%) between 2010 and 2020.⁶ A survey on the current status of medication adherence in different cities and communities in China showed

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that the nonadherence rate of hypertensive patients was as high as 58%.⁷ This will not only lead to more adverse clinical outcomes but will also further burden healthcare resources.

There are many factors that influence medication adherence in hypertensive patients, and it is important to focus on these influences. Qualitative research, which focuses on patients' perceptions, intentions, and experiences of taking medication, has the advantage of providing insights into the intrinsic factors that influence medication adherence. Therefore, it is even more important to understand the impact of patients' values and treatment preferences on the management and treatment of HTN. Focusing on patients' perceptions, intentions, and experiences of taking medication, qualitative research has the advantage of deeply analyzing the intrinsic factors affecting medication adherence and has gradually become a hot research topic. However, there are differences and limitations between the subjects and results of individual qualitative studies (eg, qualitative studies conducted in low-income countries have different findings on the causes of lack of adherence to antihypertensive medication compared with those conducted in high-income countries), and the subject matter is dispersed and does not provide a comprehensive picture of the factors that influence medication adherence. Therefore, the aim of this qualitative systematic review is to provide a summary of the barriers and facilitators of medication adherence in hypertensive patients from their perspective.

Methods

The preferred reporting items for systematic reviews and meta-analyses 2020 (PRISMA 2020) is used to guide the methodology and reporting of this systematic review.⁸ The systematic review was registered on the PROSPERO database (PROSPERO CRD42023439356).

Inclusion and Exclusion Criteria

The PICoS model recommended by the Joanna Briggs Institute (JBI) Centre for Evidence-Based Health Care was used to guide the nadir criteria. Inclusion criteria: (a) population: hypertensive patients (systolic blood pressure ≥ 140 and diastolic blood pressure ≥ 90); (b) interesting phenomena: barriers and facilitators of medication adherence from the perspective of hypertensive patients. If the article included factors influencing medication adherence as a subtheme, only the content related to medication adherence was extracted; (c) context: the whole process of medication taking by hypertensive patients in hospitals, communities, or at home; (d) study design: all types of qualitative research including mixed studies.

Exclusion criteria: (a) not published in English or Chinese; (b) incomplete or inaccessible full-text data; (c) duplicate publications; (d) conference papers; (e) qualitative studies of a particular intervention; (f) inability to separate data in mixed-method studies.

Data Sources and Search Strategy

The databases of PubMed, Embase, Web of Science, CINAHL, Cochrane Library, MEDLINE, China National Knowledge Infrastructure, Wanfang, VIP, and Chinese Biomedical were searched for qualitative studies on factors influencing medication adherence in patients with HTN. The retrieval time started from database inception to June 2023. Search terms included HTN/blood pressure, high/high blood pressure, high/high blood pressure, antihypertensive/medication, adherence/medication, compliance, and qualitative/interview/phenomenology/grounded theory/ethnography/experience. The reference list of target studies was manually reviewed to identify related research. Please refer to Supplemental Material 1.

Data Extraction

Studies were independently screened, extracted, and cross-checked for data by two researchers (Zhou and Cai). Duplicate studies were eliminated with the aid of the study management software Note Express, then progressively eliminated and screened by reading titles, abstracts, and full texts, and studies were added retrospectively based on references to finalize the included studies. Key elements of the data extraction included author, year, country, study method, study population, study content, and primary outcome.

Quality Appraisal

This qualitative systematic review was independently assessed by two researchers (Zhou and Cai) against the JBI Critical Appraisal Checklist for Qualitative Research. Items are rated as yes, no, unclear, or not applicable. Full compliance with the criteria was graded A, partial compliance with the criteria was graded B, and complete noncompliance was graded C. Ultimately, this systematic evaluation incorporates A and B-level literature for evaluation.

Data Synthesis

Data synthesis was completed through the completion of meta-aggregation, supported by the JBI SUMARI. The data were initially summarized and categorized by 2 researchers based on the similarity of the results. Finally, the researchers compared the categories. If there were any differences, they were discussed to reach an agreement. The new categories were then analyzed to produce fully integrated results, supporting information. Please refer to Supplemental Material 2.

Results

Literature Search

The flowchart for including studies in the systematic review is shown in Figure 1 (please refer to Supplemental Material). The

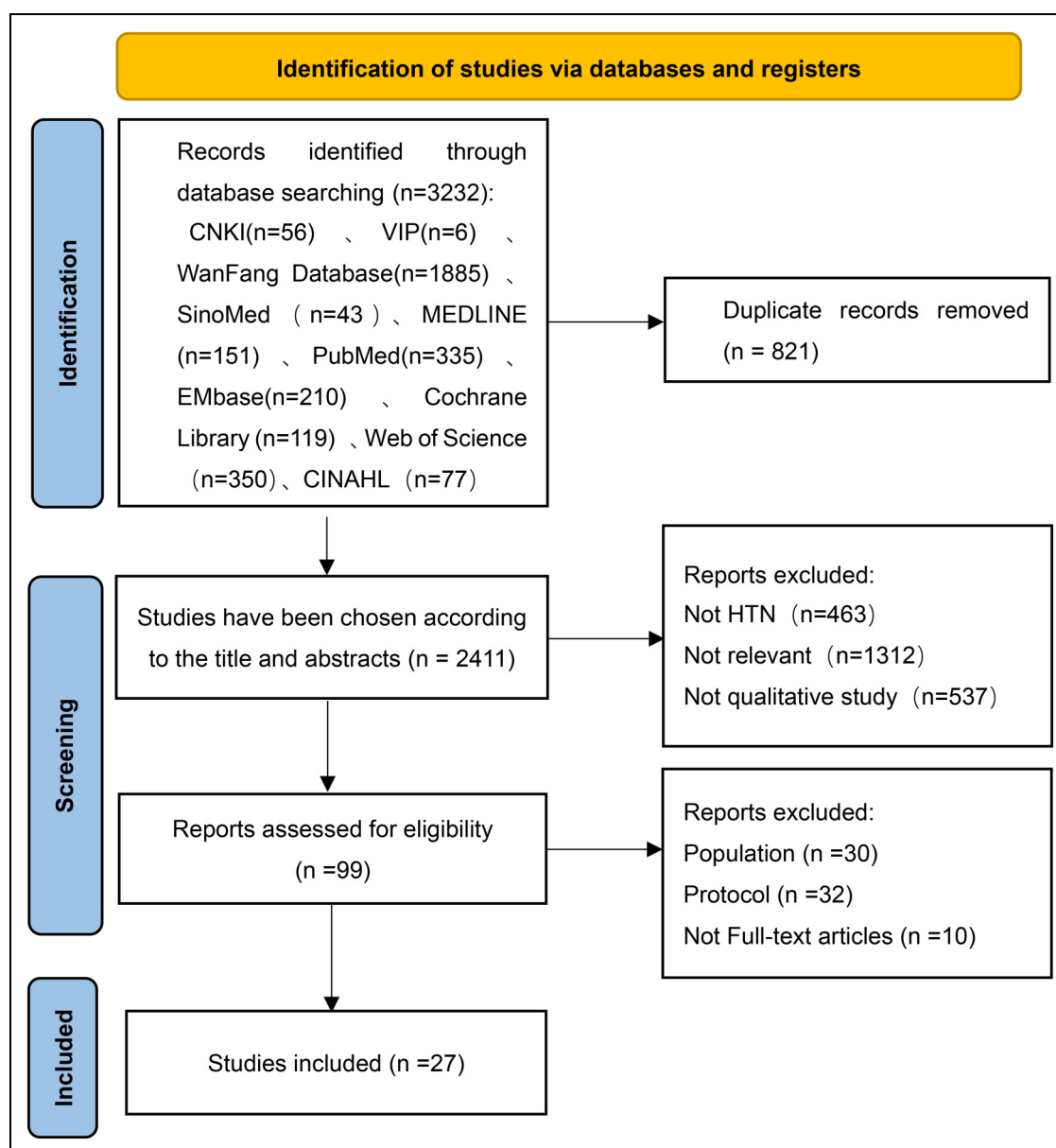


Figure 1. The preferred reporting items for systematic reviews and meta-analyses (PRISMA) flowchart for the inclusion of studies.

database search identified a total of 3232 studies. After duplication and screening, 27 studies were finally selected.^{9–35}

Characteristics of Included Studies

Most studies were conducted in the United States. Other countries and regions included China, Canada, Malaysia, Greece, New Zealand, Nigeria, South Africa, Brazil, Vietnam, Iran, Uganda, and Australia. Semistructured interviews and focus group interviews were the most common research methods, and one was a mixed-methods study. The number of participants ranged from 8 to 106. Table 1 lists the characteristics of the included research (please refer to Supplemental Material).

Quality Appraisal

A total of 27 studies were evaluated, of which 2 were graded A and 25 were graded B. The philosophical perspectives and research methodologies described are consistent across all studies. The methodology of all studies was consistent with the research questions or objectives of the study and the method of data collection. Among all the included studies, only 1 did not demonstrate the basic characteristics of the study population in detail.³³ The research methodology and interpretation of the results were consistent across all studies. Two studies illustrate the researcher's own situation in terms of cultural background and values.^{13,21} Eight studies have shown the influence of researchers on research.^{11,13,20,21,27–29,33} All study participants and their voices were well represented. Only 4 studies did not

Table 1. Characteristics of the Studies.

Studies (year)	Country	Method	Participants	Phenomenon of interest	Context	Main findings
Facilitators Benson et al (2002) ⁹	Barriers USA	Semistructured interviews	38 hypertensive patients	The ways in which patients taking antihypertensive drugs balance reservations against reasons for taking them	In the patient's home; —	(1) Positive experiences with doctors, (2) perceived benefits of taking drugs, and (3) issues relating to pragmatism (1) Desire to discontinue using antihypertensives, (2) preference for an alternative to drugs, (3) patient questioned continued necessity, and (4) possible long-term or hidden risks
Ogedegbe et al (2004) ¹⁰	USA	Semistructured interviews	106 hypertensive African-American patients; mean age 55.7	The perspectives of hypertensive African-American patients regarding the factors they perceived as barriers or facilitators of adherence to prescribed antihypertensive medications	During clinic visits or by telephone; 20–45 min	(1) Patient-specific barriers: beliefs, attitudes, and forgetfulness, (2) medication-specific barriers: side effects of pills, number of medications taken daily, frequency of dosing, taste, and treatment duration, (3) disease-specific barriers: nonapparent manifestations of HTN, (4) logistic barriers: fill their prescriptions, get refills, obtain clinic appointments with their physicians for follow-up visits, not have enough prescription refills, run out of medications (1) Have a routine, (2) use reminders, (3) good social support, (4) good doctor-patient relationship, (5) knowledge of HTN, its treatment and complications
Proulx et al (2007) ¹¹	Canada	Semistructured interviews	27 hypertensive patients; age 40 to 79	The reasons for which people fail to take blood-pressure-lowering medication regularly	In patients' homes; 90 min	— (1) Stress and living conditions in the occasional skipping or deferral of medication-taking, (2) doubt as the motivating factor for transitory, (3) subjective risk
Tsiantou et al (2010) ¹²	Greece	Semistructured interviews	25 hypertensive patients; age 40 to 79	Hypertensive patients' beliefs on HTN and antihypertensive treatment, and their role in adherence	In a private room; —	(1) Previous experience with HTN, fear of complications, (2) systematic disease management, (3) no drug reactions, and (3) no

(continued)

Table 1. (continued)

Studies (year)	Country	Method	Participants	Phenomenon of interest	Context	Main findings
Wai et al (2010) ¹³	New Zealand	Semistructured interviews	20 hypertensive patients; age 41 to 81	Reasons for adherence and nonadherence to taking blood pressure-lowering medications among the Samoan patients	Home or practice venue; 45 min	acceptance of HTN as a chronic disease, (4) incorporation of the role of the patient, and (5) a more personal relationship with the doctor (1) A lack of transport, (2) family and church commitments and priorities, (3) forgetfulness, (4) time management issues, and (5) feeling “well”
Lewis et al (2010) ¹⁴	USA	Focus group interviews	40 hypertensive patients; age 21 to 82	The behavioral, normative, and control beliefs of community-dwelling hypertensive African Americans regarding their adherence to antihypertensive medications	–; 45–60 min	(1) The medications’ adverse effects, (2) lifestyle changes, (3) stressful stuff, (4) limited financial resources, (5) neighborhood violence, and (6) distrust of healthcare professionals (1) Adverse effects, (2) did not have good relations with their physicians, (3) strongly supported the use of traditional remedies, (4) religious beliefs, (5) layman’s concept toward medications, and (6) uncertainties about the treatment and management issue
Saleem et al (2012) ¹⁵	Malaysia	Semistructured interviews	16 hypertensive patients; age 25 to 45	The perceptions and experiences of hypertensive patients toward medication use and adherence	–; 25–30 min.	(1) Negative perceptions of Western medications: adverse effects, and (2) supported the use of traditional remedies (1) Forgetfulness, (2) side-effects of pills, and (3) financial constraints
Lee et al (2014) ¹⁶	Malaysia	Semistructured interviews	23 hypertensive patients; age 38 to 64	The perceptions that patients hold toward their prescribed medications and the influences of these perceptions on their medication-taking behavior	A community health clinic; 60 min	(1) Have a routine, (2) use reminders, (3) positive attitude towards
Holt et al (2014) ¹⁷	USA	Semi-structured interviews	25 hypertensive patients; age 68 to 82	The perspectives of hypertensive patients regarding the factors they perceived as barriers or	Meeting rooms; 120 min	

(continued)

Table 1. (continued)

Studies (year)	Country	Method	Participants	Phenomenon of interest	Context	Main findings
Odusola et al (2014) ¹⁸	Nigeria	Semistructured interviews	40 hypertensive patients; age 30 to 90	facilitators of adherence to prescribed antihypertensive medications Inhibitors and facilitators for adhering to pharmacotherapy and healthy behaviors in hypertensive patients	Private hospital; 60–120 min	medication, (4) good social support, and (5) good doctor–patient relationship (1) Affordability of care, (2) trust in orthodox “Western” medicines, (3) trust in doctor, (4) dreaded dangers of HTN, and (5) use of prayer to support the efficacy of pills (1) Inconvenient clinic operating hours, (2) long waiting times, (3) underdispensing of prescriptions, (4) side-effects of pills, (5) faith-motivated changes of the medication regimen, (6) herbal supplementation/substitution of pills, and (7) ignorance that regular use is needed
Li et al (2015) ¹⁹	China	Semistructured interviews	17 hypertensive patients; age 42 to 87	Perceptions related to medication adherence in hypertensive patients	–; 20–30 min	(1) The don't-care mentality, (2) lack of disease knowledge, (3) side-effects of pills, and (4) limited drug availability
Yang et al (2016) ²⁰	China	Semistructured interviews	16 hypertensive patients; age 60 to 83	Factors influencing medication adherence and perceptions related to poor medication adherence in hypertensive patients	Agreed by both parties by telephone; 30–50 min	(1) Forgetfulness, (2) poor health awareness and lack of knowledge, (3) lack of medication monitoring, (4) economic difficulties, and (5) excessive number of doses
Petty et al (2016) ²¹	USA	Semistructured interviews	29 hypertensive patients; age 21 to 64	African Americans' perceptions of medication adherence	A private room at the clinic or at home; 30–60 min	Interest in traditional herbal medicine Incorporate medications into an existing routine
Shirindi et al (2016) ²²	South Africa	Focus group interviews	50 hypertensive patients	The objective of the study was to assess the reasons for nonadherence in women suffering from HTN	–	(1) Inadequate health literacy, (2) financial constraints, (3) forgetting, and (4) cultural differences
Marin et al (2016) ²³	Brazil	Semistructured interviews	13 hypertensive patients; age 25 to 83	The perception of patients with HTN on their nonadherence to medication	A private room; –	(1) Forgetfulness, (2) the difficulties in changing habits, and (3) need for monitoring

(continued)

Table 1. (continued)

Studies (year)	Country	Method	Participants	Phenomenon of interest	Context	Main findings
Nguyen et al (2017) ²⁴	Vietnam	Semistructured interviews	18 hypertensive patients; age 35 to 64	Factors influencing hypertensive patients' medication adherence	In a private room; 30 min	(1) Forgetfulness and (2) side effects
Najimi et al (2020) ²⁵	Iran	Semistructured interviews	18 hypertensive patients; age 23 to 60	Barriers to medication adherence in patients with HTN	In the health centers; 30–45 min	(1) Environmental challenges of life, (2) incompatibility of patients, (3) forgetfulness, (4) inefficient recommendations of family
Najjuma et al (2020) ²⁶	Uganda	Semistructured interviews	16 hypertensive patients; age 23 to 85	Reasons for adherence and nonadherence to antihypertensive medication from patients' perspectives	An outpatient clinic; 30–50 min	(1) Lack of supply in government dispensaries, (2) use of self-prescribed analgesic medication, and (3) stigma
Edward et al (2021) ²⁷	USA	Focus group interviews	34 hypertensive patients; age 30 to 65	Barriers to medication adherence in patients with HTN	A private room; 30–45 min	(1) Access barriers, (2) high cost, (3) physician factors, (4) patient factors, and (5) medication factors
Shahin et al (2021) ²⁸	Australia	Semistructured interviews	15 hypertensive patients; age 45 to 75	Factors affecting medication adherence in Middle Eastern refugees' and migrants' with HTN	Telephone; 15–30 min	(1) Forgetfulness, (2) lack of medication knowledge, and (3) distrust of doctors
Zhang et al (2021) ²⁹	China	Semistructured interviews	15 hypertensive patients; age 42 to 69	Internal factors affecting patients' medication-taking	Meeting rooms; 35 min	(1) Weak awareness of participation in medication safety management and excessive subjective medication awareness, (2) lack of health literacy, (3) poor sense of benefit from treatment, and (4) lack of patience of medical professionals
Wahab et al (2021) ³⁰	Malaysia	Semistructured interviews	23 hypertensive patients; mean age 59	Promoters and barriers to medication adherence among hypertensive individuals residing in urban and rural areas	At participants' home, their working place, or community	(1) Ignorance and (2) belief in testimony

(continued)

Table 1. (continued)

Studies (year)	Country	Method	Participants	Phenomenon of interest	Context	Main findings
Abel et al (2022) ³¹	USA	Semistructured interviews	10 hypertensive patients; mean age 54	The causes of medication nonadherence and no persistence in black women with HTN	pharmacies; 30–60 min In patients' homes; 60 min	– (1) Confined but persistent, (2) adherence as a daily part of life, and (3) motivation for adherence and persistence
Wilkinson et al (2022) ³²	USA	Semistructured interviews	42 hypertensive patients	Factors support or undermine patients' efforts to adhere to their hypertensive medications at baseline	A private room; 12–42 min	Family and community support (1) Lack of symptoms from untreated HTN, (2) fear of medication side effects, and (3) interest in traditional herbal medicine
Dian et al (2022) ³³	China	Semistructured interviews	14 hypertensive patients; age 35 to 58	The real reasons for poor medication behavior in hypertensive patients	A private room ; 30–40 min	(1) Insufficient knowledge of the disease, (2) experiencing adverse drug reactions, (3) lack of convenient doctor–patient communication channels, (4) economic factors, and (5) affected by the pace of work and life
Yang et al (2022) ³⁴	China	Semistructured interviews	8 hypertensive patients; age 61 to 80	Intention to take medication and adherence in hypertensive patients	In patients' homes; –	(1) Insufficient knowledge of the disease and (2) mental factor
Basu et al (2022) ³⁵	India	Semistructured interviews	30 hypertensive patients; mean age 53	Reasons for nonadherence to antihypertensive therapy and its socioeconomic determinants among low-income hypertensive patients	–; –	(1) Forgetfulness, (2) carelessness, and (3) running out of drug stocks

Abbreviation: HTN, hypertension.

Table 2. Data Extraction Table for Included Studies.

Original text	Subcategories	Categories	Synthesized findings
It prevents heart attacks and strokes. ¹⁴ It takes a long time to control the blood pressure, and since it won't be cured for a while, I'll be optimistic. ²⁹ I normally take it [medication] in the morning. Every morning I go take two pills. It's like a routine every day. ²¹ Been taking it so long. It's just a habit now. It's part of my day. 8:00 am, I'm up. I'm going to take my medicine. ³¹	Good disease perception Positive medication intentions Adherence as a daily part of life	High level of knowledge, belief, and action	Facilitators
Mum always reminds me, actually when we finish taking breakfast, she asks me whether I have taken medicine. At times I tend to forget, and she tells me to have breakfast and take medicine. ²⁶	Family support	Improved social support system	
You know when you are in a group, people come with different ideas... you hear what this one is doing... so you also start to practice what everyone is doing so that you all become like one family. ³²	Peer support		
I have received enlightenment about hypertension from some radio programs and from my church too; they are useful advice and I usually followed them. ¹⁸	Community support		
I appreciate my doctor very much; he explains everything to me. He doesn't care only about prescribing. He practices real medicine. ¹²	Professional medical support		
You don't have to take the medicine three times a day, you just take it once or twice. ³⁰ You (the physician) should be aware of the complications, you tell me, why should I know about it (the patient)? What benefit is it to me? ³⁵	Inadequate knowledge of medication administration	Inadequate medication literacy	Barriers
I listen to the people at the pharmacy, sometimes I buy the expensive ones, sometimes I buy the cheap ones, and none of them work too well. Sometimes I buy something expensive, sometimes I buy something cheap, but the results are not too good, so I try them all. ¹⁹ One of my friends advised me to take aspirin to control this illness, and to stop taking it before 70 this will help my blood pressure and improve my health. ²⁸	Lack of medication skills		
I suppose the underlying problem is that if you're not on medicines there's nothing wrong with you. ⁹ Some people with high blood pressure do not eat antihypertensive drugs, herbal infusions can also be drunk, they are also living well. I just do not want to take antihypertensive drugs. ³⁴	Lack of belief in medication use		
... at first I was really stressed. I didn't want to believe that I will receive an antihypertensive treatment, why me? I was feeling really sad, it was like killing me ... ¹² If you're taking medicine every day, you feel as if you're not like others. Because, you ask yourself why you're on medicine while others are not taking! ²⁶	Struggle to accept the diagnosis of the disease	Role adaptation difficulties	
For a few days, I was hospitalized and supervised until I myself came home because they did not let me, and I said that I am not important, my children want to go to school and I cannot leave them. ²⁵	Conflicts between other social roles and patient roles		
After taking the first pills, I felt serious headaches...so I stopped taking the medicines,. . .no one advised me...I waited until next month to see doctor then she changed medicine for me. ²⁴	Scared of medication side effects, adverse reactions	Treating negative experiences	
I'm always taking pills, it's so annoying. I've been taking pills for several years, and I'm sick of them. I used to take them	Fatigue from complicated treatment regimens		

(continued)

Table 2. (continued)

Original text	Subcategories	Categories	Synthesized findings
three times a day, but when I saw my blood pressure drop, I changed it to once a day, which makes it easier. ²⁰ ...I know about these traditional treatments from my father, and the truth is that these are better than Western medicine because I don't have the feeling of tiredness and weakness. I feel healthy when taking the traditional treatment unlike Western medicine. ¹⁶	A preference for alternative medicine		
Sometimes, the doctor prescribes too much or not enough medications. It is hard when you have to keep seeing the doctor for medication adjustment. ¹⁰ I take the bus because there is no car at home, but if it is a rainy day, then I stay home, because the bus stop is a little far from home. ¹³ Visiting is difficult for me because of the many hours spent in clinic, which could be used on my business; in fact, I once stopped coming for about 2 months when I realized my hypertension was "under control." ¹⁸	Constrained accessibility	Obstacles to access to health care resources	
I went to a doctor where I waited for about 2 hours for my checkup. The doctor took only about 3–4 minutes and charged me a huge fee. The medicine cost was in addition to it. He even did not listen completely to me. I am sure he is too busy making money so I did not use the medicines. ¹⁵ When I was diagnosed with HTN, I didn't get ample time to sit with the doctor to explain to me about it. ²⁷	Disappointment with healthcare services		
If you don't have the money, you can't get the medicine unless there is a program to help you... Some will go without their medicine because they can't afford to buy them. ¹⁷ I used to miss the doctor's appointment due to lack of money for transport to go to the clinic, by then my pills were finished, and there was no one to send to the clinic for my medication. ²²	Heavy economic burden		
And it often occurs during a trip or on the weekend ... because you'll be with friends and get to talking, and then you forget. ¹¹	age-related	Unintentional non-adherence	
Usually, I get up, do things for my son, and rest some more, then I'll get up running and go to work and forget. I usually take it when I arrive at work, today, for example, I have not taken it yet (...) you get there and you are so run over with work that you end up forgetting, then you remember and say "I'll take it" but then you end up forgetting to go get it. ²³	Stress from life or work		
...When I go out for a walk, I ask the pharmacy staff. I am usually quite busy at work and I don't have time to come to the hospital for a follow-up appointment. ³³	Changes in daily activities		

Abbreviation: HTN, hypertension.

provide sufficient details about ethical approval.^{12,15,19,20} The conclusions drawn in the research reports of all the studies are derived from the analysis of the data. The result of the quality appraisal is shown in Supplemental Material 3.

Review Findings

Table 2 shows the summary of subcategories, categories, and synthesis findings (please refer to Supplemental Material).

Synthesized Finding 1: Facilitators of Medication Adherence in Hypertensive Patients

Subtheme 1: High Level of Knowledge, Belief, and Action

Knowledge is the basis for behavioral change, beliefs, and attitudes are the drivers of change, and action is the process of change to achieve the ultimate goal of change. HTN prevention and control require the cooperation of patients who

take the initiative to learn about their possible risk factors and appropriate treatment options. Adequate knowledge, strong beliefs, and making medication a part of life will enable patients to be more aware of disease risks and clearly understand the health benefits of adherence to antihypertensive medication.

Subtheme 2: Improved Social Support System

Social support is an important factor in hypertensive patients' adherence to antihypertensive medication. Both healthcare professionals and patients acknowledged that significant sources of support—from families, religious groups, and local communities—can inspire patients to remain consistent with their plans. Adequate social support can encourage patients to take active health measures, improve medication adherence, and promote medication safety.

Synthesized Finding 2: Barriers to Medication Adherence in Hypertensive Patients

Subtheme 3: Inadequate Medication Literacy

Medication literacy in hypertensive patients is the ability to acquire knowledge of HTN medication through various means and to use medication techniques to take medication rationally, consistently, and accurately, supported by medication beliefs. Once HTN occurs, it must be controlled for life. During the treatment of HTN, patients with insufficient medication literacy may have many cognitive misconceptions, such as a poor understanding of the concept of HTN, using medication based on feelings, believing that medication can be discontinued when the blood pressure drops, and judging the blood pressure level based on symptoms. Patients' insufficient knowledge of HTN medication at the cognitive level makes them not form correct attitudes and beliefs about medication, which ultimately leads to undesirable medication behaviors.

Subtheme 4: Role Adaptation Difficulties

Role adaptation can be challenging for patients with HTN because it requires adaptation and emotional shifts. It is difficult for patients to accept the fact that they have the disease in the early stages of diagnosis. Some patients reported experiencing negative emotions and even a sense of stigma when they learned of their HTN diagnosis. Others experienced role conflict, for example, female patients may have more responsibility for caring for their families, which hinders role transition, which in turn affects disease management and treatment adherence.

Subtheme 5: Treating Negative Experiences

The most common reason for nonadherence to medication, as reported by patients, is fear of side effects and adverse reactions to medications, overlooking the cardiovascular risks

that result from discontinuation. In addition, some patients experience burnout due to the complexity of the prescribed medication regimen and may intentionally omit or discontinue their HTN medication. In such cases, some patients supported and preferred the use of alternative therapies, as they considered traditional alternative therapies to be economical and convenient with fewer toxic side effects.

Subtheme 6: Obstacles to Access to Healthcare Resources

Most patients reported that inconvenient transport, long waiting times for appointments, running out of medication and not being able to obtain it in a timely manner, and pharmacies sometimes running out of medicines affected their access to healthcare resources and therefore hindered adherence to medication.

In addition, unhappiness with the doctor is another factor contributing to nonadherence to HTN medication, which is highly related to the short consultation time, poor attitude, inappropriate expression, and insufficient information support in the communication between the doctor and the patient. It makes the patient distrustful of the doctor.

Finally, the economic condition of the patient is also an important influencing factor. Affordability of medicines and health check-ups is one of the main challenges faced by low-income patients, and some patients only take medicines they can afford to save on financial costs.

Subtheme 7: Unintentional Reasons

Patient forgetfulness was also a major reason for nonadherence to treatment. These participants mentioned that this memory loss occurred when they were overloaded with work or rushed to work in the morning. Some people may forget to take their medication due to their increasing age. Others, especially on weekends, go out and forget to take their medication when their daily routine changes, leading to decreased medication adherence.

Discussion

Knowledge, Belief, and Action

It is almost universally accepted that knowledge and beliefs have an important role in the tertiary prevention of HTN. A study of patients yielded different results: lack of knowledge was the most common barrier to recognizing HTN.³⁶ Previous research has also highlighted that adherence to medication in hypertensive patients with a low level of knowledge about HTN was significantly worse than in patients with a high level of knowledge.³⁷ After years of research, scholars around the world have implemented a variety of educational models, such as the health belief model, the transtheoretical model, and the empowerment education

model, which have proved to be effective in improving medication adherence in hypertensive patients.^{38–40}

Improved Social Support System

This systematic review indicates that the influencing factors of medication adherence in hypertensive patients are affected by multiple factors such as individuals, medications, health-care professionals, family, and society during the long-term medication process, which is consistent with the findings of previous studies.^{41,42} Adisa et al⁴³ found that support for hypertensive patients is mainly family support, while organizational support and practical financial support also play an important role in the disease management of hypertensive patients. The results of a survey on the social support status of hypertensive community populations in China showed that the social support of hypertensive patients was at a high level, but 24.1% of the patients still had moderate or lower social support scores.⁴⁴ Currently, intervention studies of family social support include peer support,^{45,46} health education,⁴⁷ and support applications,^{48,49} and the duration of the intervention varies from a few weeks to a year.

Inadequate Medication Literacy

Medication literacy and medication adherence are positively correlated, that is, the better the drug literacy, the better the medication adherence.⁵⁰ For example, previous studies have shown that relying on the presence of stress or symptoms to determine whether blood pressure is elevated is very similar across ethnic and geographic groups.⁵¹ Ma et al⁵² used the HTN Drug Literacy Scale to survey Chinese patients with HTN, and the results showed that drug literacy was poor and that knowledge, attitude, skills, and behavioral literacy in taking medication needed to be comprehensively improved. The development of the mobile internet in recent years has brought new interventions and tools for the management of medication adherence in hypertensive patients. A meta-analysis included 1657 patients from eight studies and showed that a smartphone intervention significantly improved medication adherence in patients with HTN.⁵³ A Chinese researcher used various reminder strategies such as medication cards, timed reminder kits, blood pressure logs, and health lectures to improve the pharmacological literacy of hypertensive patients in a comprehensive way.⁵⁴

Role Adaptation Difficulties

Psychological corollaries of stress, including increased levels of anxiety, depression, or anger, are known predictors of HTN.⁵⁵ Relevant studies have pointed out that about one-third of hypertensive patients are accompanied by varying degrees of anxiety and depression, and the incidence of anxiety and depression in hypertensive patients is five

times higher than that of the normotensive population.⁵⁶ In addition, both primary studies and systematic reviews showed that anxious-depressive disorders represent the psychiatric conditions most common in people with HTN.^{57–59} Mindfulness-based intervention (MBI) is a new type of psychological intervention, and at present, domestic and international studies have applied MBI to the emotional management of hypertensive patients. A systematic evaluation of randomized controlled trials has shown that orthostatic therapy reduces systolic and diastolic blood pressure in patients with essential HTN and, at the same time, improves anxiety and depression in patients,⁶⁰ consistent with previous studies.^{61,62} In addition, there are a number of digital interventions that have been applied to the management of negative emotions in hypertensive patients.⁶³

Treating Negative Experiences

Patients with HTN reduce or discontinue their medication on their own due to the complexity of their medication regimen.⁵⁰ The 2017 American College of Cardiology/American Heart Association Guidelines for adult HTN recommend the use of a fixed-dose combination to improve adherence to antihypertensive therapy.⁶⁴ A meta-analysis suggests that fixed-dose combinations significantly improve medication adherence in hypertensive patients compared to multipill combinations,⁶⁵ but their safety needs to be further investigated.⁶⁶

Fear of medication side effects is one of the main reasons for medication adherence. Clinicians should focus on patients' needs in the diagnostic and treatment decision-making process and formulate optimal clinical decisions based on individual patient's characteristics. The American Heart Association's scientific statement recommends patient–physician shared decision-making, which promotes equity by engaging clinicians and patients, sharing the best available evidence, and recognizing the needs, values, and experiences of individuals and their families.⁶⁷ According to a qualitative study, consultations should give patients the chance to learn about their disease, comprehend that they have treatment options, and discuss these options with physicians in order to better enable shared decision-making.⁶⁸ In addition, doctors can use the reference results given by artificial intelligence to assist in recommending medication. For example, Duan et al⁶⁹ developed an X-learner machine learning model that can be automatically built into an electronic medical record that predicts whether hypertensive patients are more likely to benefit or risk medication based on demographic and clinical characteristics.

Obstacles to Access to Healthcare Resources

As reported by the patient, poor doctor–patient communication seems to be the main reason, mainly in terms of shorter consultation times, impatient attitudes, inappropriate communication styles, and insufficient information provided,

thus leading to a decrease in patient trust. The development of digital health provides a new strategy for medication management for hypertensive patients, which can provide accurate medication assessment, personalized medication intervention, and real-time medication counseling for hypertensive patients regardless of time and space constraints, so as to improve the quality of healthcare and medication adherence of patients.⁷⁰

In addition, HTN requires lifelong treatment, and the affordability of medications and health screenings is one of the major challenges for low-income patients. Ma et al⁷¹ found that medication nonadherence rates were higher among patients who were not covered by the chronic disease policy than among those who were covered by the policy. Therefore, there is an urgent need for sustainable financing, affordable pricing, and a reliable supply system to enhance attention and support for hypertensive patients (especially those in vulnerable groups, such as those with financial difficulties).

Unintentional Nonadherence

Video-, SMS-, and mobile app-based medication education and reminders are some of the more common medication adherence interventions in cardiovascular disease.⁷² At the same time, patients with low medication adherence expressed a desire for a mobile phone medication reminder service.⁷³ Mehas et al⁷⁴ used an electronic medication reminder cap to remind and monitor hypertensive patients to take their medication on time, and although the results were not statistically significant, they provided a new way of thinking about medication reminders at a later stage. Future research could explore the effectiveness of medication management services for hypertensive patients in the real world by tailoring them to the context of each region's own healthcare infrastructure, patient health literacy, etc.

Implications for Research and Practice

This systematic review provides a qualitative meta-integration of facilitators and obstacles and focuses on the patient's perspective to show the complexity of the factors influencing medication adherence in hypertensive patients, which is consistent with the findings of previous studies.⁷⁵

Hypertensive patients are the ultimate implementers of drug regimens. Studies indicate that treatments focusing on patient behavior have a higher probability of positively impacting medication adherence compared to those that target medical professionals or the system.⁷⁶ Therefore, it is necessary to shift the focus to the needs of the patients themselves. Scientific and effective methods should first be used to assess the medication adherence of hypertensive patients, screen the low medication adherence population, identify their obstacles, pay attention to the subjective sense of medication use, increase the time for an in-depth understanding of the patient's living environment and psychological state,

implement personalized, comprehensive and holistic interventions, and provide patients with all-rounded support and management, such as increasing shared decision-making and using mobile medical technology to carry out medication reminder, and so on.

Importantly, the relevant government departments should improve policy protection for all parties, such as increasing the amount of medical reimbursement subsidies, lowering the threshold for policy declarations, and formulating compensation programs by graded categories of diseases. Policy support for family carers should be strengthened, such as improving the long-term care system and establishing a sound support system for family carers in terms of psychology, information, and social interaction. The construction of systems related to mobile medical care has been improved, and a sound long-term follow-up mechanism has been established.

Limitations

This systematic review brings together qualitative research from different countries with varying socioeconomic conditions and resource use. This places limitations on accurate reporting of barriers and facilitators, and it will be important in the future to standardize the qualitative research process, taking into account all the different barriers, to increase our confidence in identifying the most important changeable barriers and making comparisons between regions and populations. Most of the analyzed studies focused on a small number of participants. This may be due to the fact that the studies conducted were qualitative and time-consuming, which did not allow for the extension of the research program to a larger number of participants. The type of research design included in the literature was relatively homogenous, with semistructured interviews dominating. The quality of the studies was moderate, as 2 were graded A and 25 were graded B. Finally, the studies included in this review had relevant heterogeneity in terms of patient characteristics. This evidence suggests that there may be some bias in this meta-integration.

Conclusions

This qualitative meta-integration study systematically reports on facilitators and impediments to medication adherence in hypertensive patients from the patient's perspective. This study adds to our understanding of the impact of medication adherence in patients with HTN and may help to improve programs by addressing the medication needs of hypertensive patients. The essence of this study is to integrate the fragmented information from qualitative research into a more coherent and comprehensive theoretical framework, providing new perspectives and understanding of the field. Medication adherence in hypertensive patients remains a challenge to be addressed. Future research should explore how complex interventions using a combination of evidence-based

strategies and targeting multiple adherence behaviors (eg, long-term adherence to medication) are effective in improving medication adherence.

Author Contribution Statement

XZ designed the research, conducted the systematic review, and drafted the manuscript. XZ and NG reviewed it critically for important intellectual content; WC and JF also screened articles, provided writing support, and edited. All authors gave their final approval.

Data Availability Statement

The data underlying this article are available in the article and online Supplemental Material.

Declaration of Interest Statement

The authors declare that there are no conflicts of interest.

Ethical Standards

Ethical approval was not required as the study is based on data retrieved from already published studies.

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