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Self-management in young and middle-aged patients with hypertension: a systematic review and meta-synthesis of qualitative studies

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Abstract

Background There has been a sharp increase in the prevalence of hypertension in young and middle-aged people at high risk of the disease. Despite the fact that good self-management can be effective in controlling blood pressure, patients do not perform well in this area, resulting in poor blood pressure control. It is therefore particularly important to gain a thorough understanding of patients' attitudes to self-management and the factors that influence them. The aim of this study was to synthesise the qualitative research on attitudes, motivations and challenges of self-management in young and middle-aged hypertensive patients, to analyse the synthesised results using the COM-B model and to propose appropriate improvement actions.

Methods From the time of construction until May 2023, the system searched PubMed, Web of Science, ProQuest, Embase, MEDLINE, CINAHL, PsyCINFO and CNKI databases. The analyses were carried out using a thematic synthesis approach to summarise the key findings. The findings were then mapped and analysed using the COM-B model.

Results A total of 11 studies were included, involving 250 patients between the ages of 18 and 64. Four themes with ten sub-themes were identified: Poor disease recognition (low disease perception, fuzzy disease knowledge); Barriers to doctor-patient interactions (short communication time, unmet knowledge needs, incomplete guidance for disease management); Living in a hostile environment (heavy workload, lack of companionship, ignorance of families); Expectations for a healthy body (responsibility of family roles, witness the cruelty of illness). Analysis of the composite results based on the COM-B model showed that low disease perceptions, barriers to doctor-patient interactions and life circumstances with enemies on all sides were the main challenges faced by young and middle-aged hypertensive patients, whereas the expectation of a healthy body was a motivation to promote self-management of blood pressure in patients.

Conclusions This study shows that family responsibilities are a particular motivator for self-management in young and middle-aged hypertensive patients. In response to the problems they face, we believe that meeting patients' knowledge needs, improving healthcare professionals' communication skills and valuing the role of community hospitals are effective ways to promote patient self-management. In the future, telemedicine, mobile healthcare and intelligent monitoring devices will provide a solution to reduce the burden on medical resources.

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Keywords Young and middle-aged, Hypertension, Self-management, Qualitative research, Systematic synthesis

Introduction

High blood pressure (hypertension) is a common chronic disease [1], with an estimated 1.28 billion people worldwide suffering from hypertension, and this number is expected to rise to 1.58 billion by 2050 [2]. More worryingly, the age of onset of hypertension is getting younger [3], with younger patients facing higher disease risks such as greater susceptibility to cardiovascular disease, cognitive decline and increased risk of death [4, 5].

It is reassuring to know that high blood pressure can be controlled with good self-management [6]. Self-management is the ability and behaviour of patients to cope with their symptoms, the treatment of their disease and the social changes in their daily lives, physiology and psychology as the disease progresses [7, 8]. However, young patients have significant deficits in self-management of hypertension [9], resulting in suboptimal blood pressure control. A study from China showed that blood pressure control rates were only 3.8% for 18–39-year-olds and 11.7% for 40–59-year-olds [10]. Therefore, the rapid increase in the young and middle-aged hypertensive population and the poor control of blood pressure need to be taken seriously by the community.

Although quantitative studies can use questionnaires or scales to explore the factors that influence self-management in people with high blood counts [11], these studies do not provide an understanding of how patients really feel or explain their behaviour. Qualitative research can address this limitation. And the integration of multiple qualitative studies not only allows for a deeper interpretation of the phenomenon, but also makes the results more scientific, comprehensive and reliable. As a result, an increasing number of researchers are exploring the factors that influence patient self-management through qualitative synthesis. For example, a scoping review by Andi explored the facilitators and inhibitors of self-management practices among hypertensive patients over the age of 18 in South East Asia [12]. Amelia provides a comprehensive review of factors that may influence self-management in adult Hispanics with hypertension [13]. A systematic review by Orjola examined perceptions of self-management and the effectiveness of self-management in patients with hypertension (unspecified age) [6]. Unfortunately, we have not been able to clearly capture the voices of young and middle-aged hypertensive patients in these studies.

Understanding the attitudes, motivations and challenges of self-management in young and middle-aged patients will help to promote self-management, maintain good blood pressure and reduce the incidence and development of complications. To the best of our knowledge, there is a lack of qualitative, comprehensive studies looking at self-management in this hypertensive population. Therefore, this study will fill the gap in this area and provide new perspectives and understanding of self-management in hypertensive patients.

The COM-B model is a theoretical model that explains the factors that influence behaviour and indicates the appropriate form of nursing intervention [14]. The model suggests that the occurrence of target behaviours (self-management behaviours) is influenced by the individual's capabilities (physical and mental), the motivations that enable the behaviour to occur (reflective and automatic), and the opportunities (both physical and social). This theoretical perspective allows a better understanding and analysis of the integrated problem of self-management in young and middle-aged hypertensive patients.

In summary, the aims of this study were (1) to provide a systematic synthesis of qualitative studies on the attitudes, motivations and challenges of self-management in young and middle-aged patients; and (2) to analyse the findings using the COM-B model to understand the influencing factors and suggest appropriate interventions.

Methods

This study follows the PRISMA 2020 report [15] and the Enhancing Transparency in Reporting Qualitative Research Synthesis (ENTREQ) statement [16], to ensure transparency in research reporting (Supplementary file 1). Thematic synthesis was conducted using Thomas and Harden's three-stage framework [17]. Finally, the results are mapped into the COM-B model for analysis. The study is registered with PROSPERO (CRD42018100810).

Data sources

Literature from eight databases, PubMed, Web of Science, ProQuest, Embase, MEDLINE, CINAHL, PsyCINFO and CNKI, was searched from the time of construction to 1 May 2023. The systematic search was conducted by two researchers, and the reference lists of relevant studies were manually searched for completeness. Supplementary file 2 describes the search formulas used in the different databases. After the screened articles were imported into EndNote 9 software to remove duplicates, two researchers (HRY and FXW)

independently screened the titles and abstracts against the inclusion criteria, disagreements were resolved by a third researcher(HAL), and finally, three researchers independently screened the full text of the selected articles (article selection not disputed), and disputed parts were resolved by joint deliberation.

Study eligibility criteria

We used the PICoS model recommended by the Joanna Briggs Institute (JBI) to develop the selection criteria. Inclusion criteria are as follows: P (population) for young and middle-aged people (18–64 years) with hypertension; I (interest of phenomena) for current status of self-management; Co (context) for any national, primary, secondary and tertiary health care; and S (study design) for qualitative research, including phenomenological research, grounded theory, ethnography and other qualitative research methods. Excluded conditions are as follows: mixed studies, articles not in English or Chinese, reviews, conference abstracts, reports and non-journal articles, and articles for which full text was not available.

Quality assessment

The reviewed literature was assessed for quality by two researchers (HRY and WFX) using the Joanna Briggs Institute (JBI) qualitative research inventory [18]. The qualitative research inventory consists of 10 items, each of which is scored as 'yes', 'no' and 'unclear'. Questions answered 'yes' received a score of 1 and were scored as low (0–4), medium (5–7) and high (8–10). A score below 5 is considered a low-quality study and will be excluded. The quality of the literature was assessed by two researchers individually, and disagreements were resolved by a third researcher (HZQ) through discussion.

Data extraction

Data were extracted by two researchers and cross-checked by a third. Data extracted included authors, year of publication, country; objectives and/or research questions; participants; methodological framework; data collection methods; data analysis methods; and findings/results.

Data synthesis

Thematic synthesis of the data was conducted using Thomas and Haddon's methods [19]. The data is the full text of the 'finding' or 'result' of the article that meets the requirements. The data were analysed in three steps: coding the text, developing descriptive themes and generating analytical themes. Line-by-line coding was first carried out independently by two researchers using NVivo11 software to understand meanings and compare content, followed by grouping by analysing similarities and differences between codes to organise descriptive themes, and finally summarising and integrating the descriptive themes with the research questions, further developing them into analytical themes and sub-themes. This process was repeated until all line-by-line descriptive themes were adequately captured in the analysed themes. Disagreements were resolved by consultation with a third researcher.

Results

Study and participant characteristics

A total of 961 articles were retrieved and 11 were included after removing duplicates and articles that did not meet the inclusion criteria, as shown in Fig. 1. The 11 included studies involved 250 young and middle-aged hypertensive patients aged 18–64 years. Two studies included only females [20, 21], and one study included only males [22]. The included studies involved six countries, including two in Malaysia [23, 24], four in America [21, 22, 25, 26], two in China [27, 28], one in Brazil [29], one in Denmark [30] and one in Bangladesh [20]. Eight of the included studies used interviews [20–24, 29], two used focus groups [25, 26] and one was not specified [30].

Of the data analysis methods, four used thematic analysis [20–22, 26], two used Colaizzi's seven-step analysis, two used content analysis [24, 25], one used descriptive-reductive-interpretive schema [23, 30], one used interpretive phenomenological analysis [25] and one used grounded theory analysis [29]. Subjects included in the study and study characteristics are shown in Table 1. We used the JBI Qualitative Research Inventory to assess the quality of the 11 included articles, and the results showed that all selected articles were of medium and high quality, as shown in Table 2.

Synthetic results

We have identified four themes with ten sub-themes: Poor disease recognition (low disease perception, fuzzy disease knowledge); Barriers to doctor-patient interactions (short communication time, unmet knowledge needs, incomplete guidance for disease management); Living in a hostile environment (heavy workload, lack of companionship, ignorance of families); Expectations for a healthy body (responsibility of family roles, witness the cruelty of illness), as shown in Table 3.

Poor disease recognition

Low disease perception

Low disease perception is mainly reflected in poor medication adherence and difficult lifestyle changes. Poor medication adherence is mainly reflected in patients' own minimisation of the disease and resistance to taking medication. Medication was not a 'priority' [23]. In

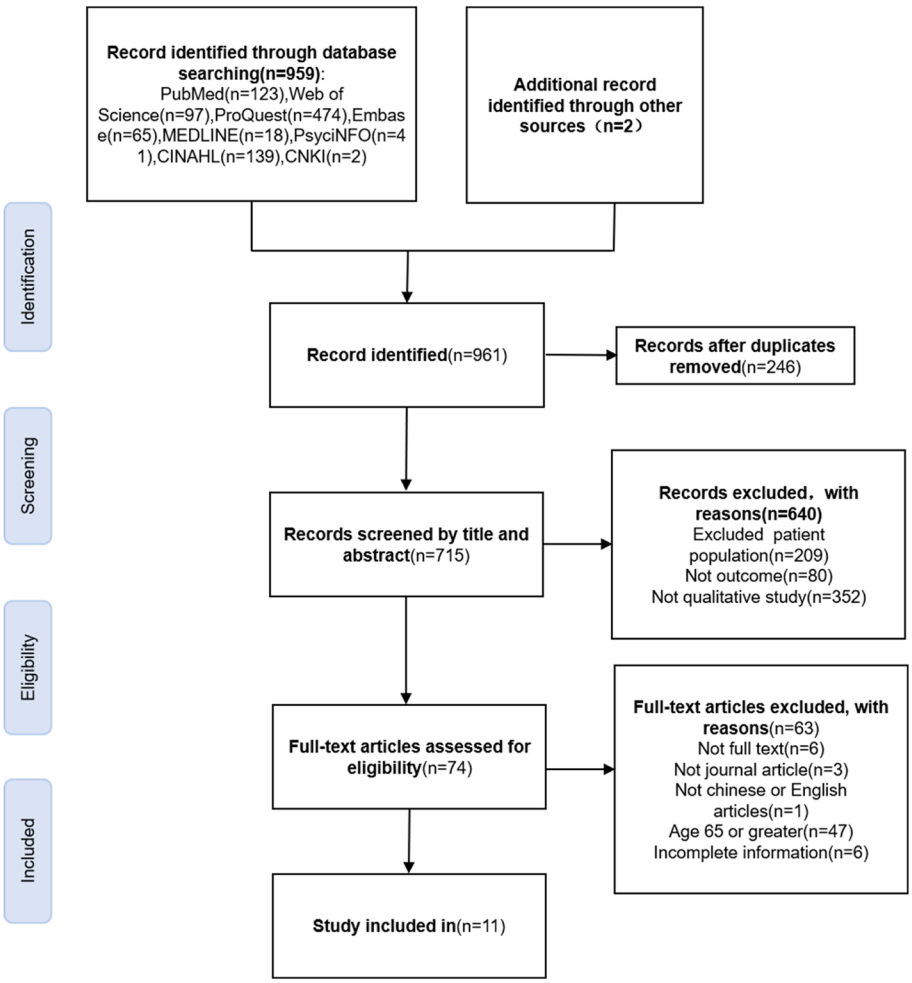

Fig. 1 Literature screening flow chart

young and middle-aged patients, clinical symptoms were not obvious [20, 22, 25, 30], and therefore most patients in the study cited 'busy schedules' and 'missing' medication as reasons for not taking their medication regularly [22, 25, 23, 26], and believed that medication was not a 'priority' [23]. Some patients are so confident about their health that they believe they 'don't need' medication [23, 25] or that they can 'control' the disease [30, 23]. The difficulty of lifestyle change is reflected in the fact that the vast majority of patients 'know' that a healthy lifestyle is good for the disease, but are unable to do so [20, 22, 23, 25, 27, 28]. Daily activities such as diet [20, 21, 27], exercise [27] and blood pressure measurement [20, 23] were only marginally improved when there was a change in disease or clinical symptoms. We also found that exercise was a 'more acceptable goal' for young and middle-aged patients compared to dietary changes [23, 25, 29]. Lifestyle changes require a long period of adherence, but most patients adhere to management only briefly at the time of diagnosis and often abandon it later due to laziness or lack of motivation, and they want to have clear goals and be monitored [20, 25, 23, 27, 28]. In addition, home blood pressure monitoring is not encouraging, as patients support the benefits of regular blood pressure monitoring for disease control, but most continue to monitor their blood pressure only when they feel 'unwell'or have symptoms of hypertension [20, 23].

Fuzzy disease knowledge

Most young and middle-aged patients understand some basic knowledge about blood pressure management and what conditions may 'trigger' the disease, and will consciously avoid them in their daily life. However, due to the lack of accurate knowledge about the disease, they often follow the wrong advice or are unable to manage the disease effectively [20–23, 25–28, 30]. Some patients lack knowledge about the complications of hypertension and the medications used to treat it, leading to minimisation

Table 1 Extraction of original research data

Author	Publication date	Country	Participants	Method framework	Data collection	Data analysis	Objectives and/or research questions	Theme and subtheme
Shima	2014	Malaysia	*n* = 25 Age, 49 ± 9.3 Females, 14	Qualitative study	In-depth interviews	Schema of description-reduction-interpretation	To explore patients' experiences with their illnesses and the reasons which influenced them in not following hypertensive care recommendations in primary health clinic settings	1. Symptoms of hypertension at first diagnosis 2. Barriers and facilitators of hypertensive care nonadherence with antihypertensive medication 3.Barriers and facilitators of hypertensive care nonadherence with physical activity and diet 4. Issues with health care professionals and health care system
Balduino	2016	Brazil	*n* = 28 Age, 18–59 Females, 23	Grounded theory	A semi-structured interview	Grounded theory analysis	To interpret how hypertensive patients experience health care self-management	1. The beginning of the illness 2. Understanding the disease process 3. Incorporating behaviour for self-management of the disease 4. Experiencing attitudes and actions in the control and treatment of the disease 5. Being treated in the public healthcare system
Johnson	2016	America	*n* = 38 Age, 18–39 Females, 25	Qualitative study	Focus group	Conventional content analysis	To assess their perspective of barriers to hypertension treatment and control	1. Emotions and reactions after a hypertension diagnosis 2. Attitudes about managing hypertension (lifestyle changes, follow-up visits, antihypertensive medication use) 3. Opinions about their healthcare system's hypertension education materials 4.Opinions about using social media to manage hypertension

Table 1 (continued)

Author	Publication date	Country	Participants	Method framework	Data collection	Data analysis	Objectives and/or research questions	Theme and subtheme
Lu	2017	China	*n* = 13 Age, 29–43 Females, 6	Qualitative study	A semi-structured interview	Colaizzi's seven-step analysis method	Exploring the understanding and experience of young people with first diagnosis of hypertension, developing individual needs and targeted healthcare services	1. Knowledge of disease 2. The experience of illness
Ye	2018	China	*n* = 16 Age, 29–59 Females, 6	Phenomenology	A semi-structured interview and in-depth interview	Colaizzi's seven-step analysis method	Exploring the self-care experiences of young and middle-aged hypertensive patients based on self-determination theory	1. Lacking of doctor-nurse-patient communication lowered sense of belonging 2. Insufficient participation in self-care plan, lowered independence 3. Unclear self-care goals, insufficient informative support and reduced competencies 4. Satisfaction of motivation needs can help improve self-care abilities
Rose	2001	America	*n* = 19 Age,33–49 Females, 0	Qualitative study	A semi-structured interview	Thematic analysis	Investigate the contextual influences on black males' responses to high blood pressure management	1. Personal contexts of the meaning of health, high blood pressure and treatment recommendations 2. Social contexts of living as a black man in an inner city environment 3. Cultural contexts of the patient–provider relationships and their relevance to effectiveness of treatment
Sångren	2009	Denmark	*n* = 17 Age, 35–50 Females, 8	Qualitative study	Unclear	Interpretive phenomenological analysis	To explore patients' adaptation to hypertension and to describe its impact on their sense of body, biographical experience, approach to life and daily activities	1. Hypertension and biography 2. Altered sense of body 3. Altered approach to life and sense of self

Table 1 (continued)

Author	Publication date	Country	Participants	Method framework	Data collection	Data analysis	Objectives and/or research questions	Theme and subtheme
Lee	2014	Malaysia	*n* = 23 Age, 38–60 Females, 11	Qualitative study	A semi-structured interview	Content analysis	To understand hypertensive patients' perceptions of and adherence to prescribed medication	1. Perceptions of the prescribed medications 2. Positive perception of WMs (Western medicines) 3. Negative perceptions of WMs 4. Positive perceptions of CAMs (complementary and alternative medicines) 5. Negative perceptions of CAMs 6. Positive versus negative perceptions of WMs 7. Positive versus negative perceptions of CAMs 8. Types of adherence behaviours
Franklin	2016	America	*n* = 13 Age, 26–39 Females, 13	Phenomenology study	A semi-structured interview	Thematic analysis	To describe the experiences of women with HTN self-managing their perceived BP changes	'Getting to normal' (I can tell, tending to it,the wake-up call, doing it right)
Boitchi	2021	Bangladesh	*n* = 23 Age, 34–64 Females, 0	Narrative analysis approach	Unstructured interview	Thematic analysis	Explores the understanding, management practice and challenges related to hypertension among hypertensive women in rural Bangladesh	1. Patients' perception of hypertension 2. Hypertension management practices 3. Hypertension management challenges
Monroe	2013	America	*n* = 35 Age, 43–63 Females, 16	Qualitative study	Focus group	Thematic analysis	To explore HIV-positive patients' perspectives on living with HIV and diabetes mellitus (DM) or hypertension (HTN) and factors affecting medication adherence	1. Comorbidities are a source of concern and frustration, sometimes eclipsing concern regarding HIV 2. Understanding of health conditions and medications promotes adherence 3. Simpler regimens with fewer side effects promote adherence 4. Untreated substance abuse and mental health issues hinder adherence

Table 2 Quality appraisal of studies using JBI Checklist for Qualitative Research

Study	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
1. Shima et al	Y	Y	Y	N	Y	Y	U	Y	Y	Y
2. Balduino et al	Y	Y	Y	N	Y	N	U	Y	Y	Y
3. Johnson et al	Y	Y	Y	N	Y	N	U	Y	U	Y
4. Lu et al	Y	Y	Y	N	Y	N	N	Y	Y	Y
5. Ye et al	Y	Y	Y	Y	Y	N	N	Y	Y	Y
6. Rose et al	Y	Y	Y	N	Y	N	U	Y	U	Y
7. Sångren et al	Y	Y	Y	N	Y	N	U	Y	U	Y
8. Lee et al	Y	Y	Y	Y	Y	N	N	Y	Y	Y
9. Franklin et al	Y	Y	Y	Y	Y	N	U	Y	Y	Y
10. Boitchi et al	Y	Y	Y	N	Y	N	Y	Y	Y	Y
11. Monroe et al	U	Y	Y	N	Y	N	Y	Y	Y	Y

Y yes, *N* no, and *U* unclear

①Was there a clear statement of the aims of the research? ②Is a qualitative methodology appropriate? ③Was the research design appropriate to address the aims of the research? ④Was the recruitment strategy appropriate to the aims of the research? ⑤ Was the data collected in a way that addressed the research issue? ⑥Has the relationship between researcher and participants been adequately considered? ⑦Have ethical issues been taken into consideration? ⑧Was the data analysis sufficiently rigorous? ⑨Is there a clear statement of findings? ⑩How valuable is the research?

Table 3 Themes and sub-themes

COM-B domain	Theme	Subtheme	Sources
Psychological capability	Poor disease recognition	Low disease perception	20–22,25,27–32
		Fuzzy disease knowledge	20–22, 25, 27, 28, 30–32
Physical capability	None	None	None
Physical opportunity	Living in a hostile environment	Heavy workload	20, 25, 27, 28, 31
Social opportunity	Living in a hostile environment	Lack of companionship	20, 25, 27, 28, 31
		Ignorance of families	20–22, 31, 32
	Barriers to doctor-patient interactions	Short communication time	21, 22, 24, 25, 27–29, 31
		Unmet knowledge needs	20–23,24,25,27–29,31,32
		Incomplete guidance for disease management	27,28
Reflective and automatic motivation	Expectations for a healthy body	Responsibility of family roles	20–22, 30, 31
		Witness the cruelty of illness	21, 29–31

of the condition and resistance to the medications used to treat it [20, 25, 27–29, 23]. As one patient put it, 'I don't know the dangers of high blood pressure and targeted, individualised medication [27]'.

Barriers to doctor-patient interactions

Short communication time

Most patients want to provide their doctors with complete information about themselves and receive appropriate responses, but due to the high volume of outpatient visits, communication time is too short, resulting in inadequate access to information for patients [21–25, 27–29]. As one patient put it, 'I don't tell my doctors about my problems with taking my medication. They usually say something like, "OK, just take your medicine, you can go now". It's not even five minutes compared to the long wait [23]'.

Unmet knowledge needs

They are very concerned about the side effects of therapeutic drugs, and the side effects of drugs are one of the reasons why they are resistant to taking drugs, and they hope that their doctors can inform them about the side effects of drugs and how to deal with them when they occur, but they are rarely satisfied with the process of medical consultation [22, 24, 25, 27, 28, 23, 26, 29]. In addition, due to a lack of knowledge about antihypertensive drugs, they are very resistant to prescription drugs, especially in Asia, and most of them try to use other treatments (e.g. traditional medicines) instead of prescription drug therapy [20, 21, 23, 24, 27]. But few doctors are able to listen and offer solutions. As one patient

said, '… As a rule of thumb, I would never tell a doctor that I use ginseng powder and herbs, which I alternate with clinic drugs. Do you know what happens? I just say "an herbalist told me that ginseng powder helps control blood pressure ……. " Before I could finish my statement, the doctor told me to stop talking nonsense and only take the medicine he prescribed …… [24]'.

Incomplete guidance on disease management

Most patients felt that they needed detailed guidance from healthcare professionals on the day-to-day management of their condition [27, 28], but sometimes the guidance from healthcare professionals was not personalised or comprehensive, leading to confusion and mistrust of healthcare professionals. As one patient said: '…… The doctor told me that I have to take medication all the time and that I have to make sure that I eat with less oil and less salt, so to what extent is less oil and less salt considered less oil and less salt? I think my home and the restaurant is considered very light compared to the taste, I would like to ask again, he looked at the next patient [28]'.

Living in a hostile environment

Heavy workload

'Lack of time' was the main deterrent cited by the majority of patients [20, 23, 25, 27, 28]. Many patients cite a lack of time for healthy activities, or even believe that work stress is a contributing factor. As one patient said, 'I work and work and work without sleeping. I don't have time to rest and I feel stressed [23]'.

Lack of companionship

Through our synthesis, we found that young and middle-aged patients need mutual encouragement and supervision from their patients, and they want to find a partner to exercise with or a good role model [20, 25, 27, 23, 28].

Ignorance of families

Family members' misconceptions about hypertension can also affect patients' blood pressure management [20–23, 26]. Patients have a close relationship with their families, whose neglect or misunderstanding of the disease can lead to difficulties with dietary changes or inappropriate behaviours. As one patient put it: 'My wife still cooks food high in salt and fat, even though she knows I have high blood pressure' [23] Or: 'All my children have advised me to try alternative medicine first because they don't want me to become too dependent on medication [23]'.

Expectations for a healthy body

Responsibility of family roles

Derived from the responsibility of family roles, they carry out the management of the disease. They want to be with their families, raise their children and do not want to die prematurely [20–23, 30]. As one patient put it, 'I'm thinking a lot about my little boy. What will happen to him, of course I hope he …… I'll be around at least until he's older …… I'll be able to see him get on as an adult [30]'. Love for their children and family motivates them to take the disease seriously.

Witness the cruelty of illness

Hypertension is often comorbid with other serious illnesses, and it is only after witnessing or experiencing a major medical event that patients realise the seriousness of hypertension, become more aware of the condition and control their blood pressure [21, 29, 23, 30]. As one patient put it: '……. We found his office full of unused blood pressure medication. I think he died of something that could have been prevented. I saw my mother mourning him and how desperate she was. He knew something was wrong. He knew about his blood pressure, but he didn't do anything about it [30]'. Other patients who experience complications from hypertension begin to change their poor lifestyle and actively manage their disease after developing anxiety. As one patient put it, 'I had to take it seriously. That's what the doctor said, he said, "Because you didn't realise you'd had a stroke," and I didn't realise it either [21]'.

Reflection

We mapped the synthesised results (four themes ten sub-themes) into the COM-B model. C (capability) includes both physical and psychological components. We mapped the theme of disease perception to the mental component of competence. O (opportunity) refers to all factors outside the individual, including both physical and social components. We mapped the life circumstances with living in a hostile environment (heavy workload, lack of companionship, ignorance of families) and barriers to doctor-patient interactions (short communication time, unmet knowledge needs, incomplete guidance for disease management) to the opportunities section. M (motivation) refers to all the brain processes that inspire and direct behaviour. We mapped the expectations for a healthy body (responsibility of family roles, witness the cruelty of illness) to the motivation section (Table 3, Fig. 2). We mapped the results to the COM-B model and proposed clinical interventions by combining the combined results with the corresponding 9 interventions (Table 4).

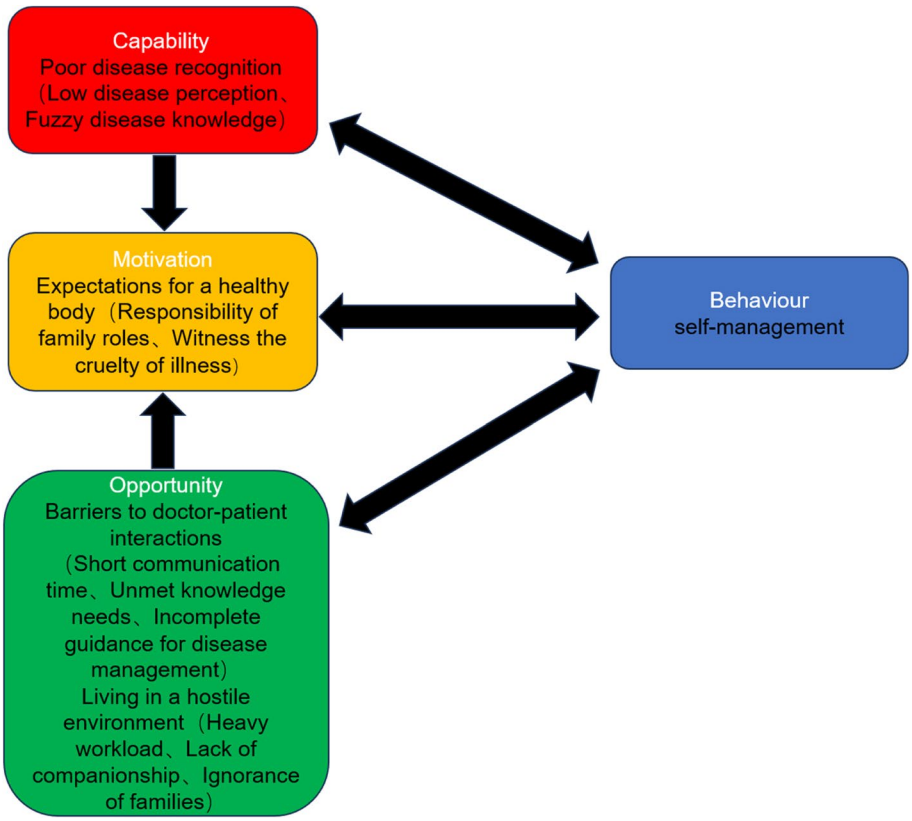

Fig. 2 Mapped to COM-B model

Table 4 Interventions in the COM-B model

Interventions	Definition
Education	Increasing knowledge or understanding
Persuasion	Using communication to induce positive or negative feelings or stimulate action
Incentivisation	Creating expectation of reward
Coercion	Creating expectation of punishment or cost
Training	Imparting skills
Restriction	Using rules to reduce the opportunity to engage in the target behaviour (or to increase the target behaviour by reducing the opportunity to engage in competing behaviours)
Environmental restructuring	Changing the physical or social context
Modelling	Providing an example for people to aspire to or imitate
Enablement	Increasing means/reducing barriers to increase capability or opportunity

Discussion

Our review included a total of 11 papers that explored the qualitative findings of young and middle-aged hypertensive patients regarding disease self-management and analysed the combined results in the context of the COM-B model. Despite the growing interest in research topics related to self-management in hypertensive patients, no qualitative systematic synthesis of self-management in young and middle-aged hypertensive patients has been found in the literature. Our study therefore extends the field of hypertension self-management.

Similar to previous findings [31], our study found that young and middle-aged hypertensive patients had poorer self-management skills. Poor disease recognition, barriers to doctor-patient interaction and living in a hostile environment are the challenges faced by young and

middle-aged hypertensive patients. Expectations for a healthy body are the motivation for blood pressure self-management. The results of a study by Orjola showed that self-management in hypertensive patients was associated with disease characteristics, medication adherence, family factors (lack of support), environmental factors (sense of security, local amenities, availability of healthy food), disease information and self-monitoring [6]. However, our study found that young and middle-aged people with hypertension have more work pressure [20, 23, 25, 27, 28] and family responsibilities [20–22, 30, 23]. The impact of family responsibilities on self-management in young and middle-aged hypertensive patients has rarely been addressed in previous studies. Young and middle-aged patients are at the center of their families, often supporting their parents and raising the next generation, and the responsibilities of their family roles are a driving force in promoting self-management in patients. Heavy workloads not only cause psychological stress for patients but also compress their time for daily life and reduce the time for healthy behaviours, which is the biggest obstacle to self-management. Therefore, considering how to balance work and disease management in young and middle-aged hypertensive patients may be the next step for health professionals to focus their research.

We mapped the results to the COM-B model by combining the combined results with their nine corresponding interventions [14] and selected three interventions, education, environmental restructuring and persuasion, to provide clinical advice. Educational interventions not only meet the patient's need for knowledge about the disease and improve doctor-patient communication but also improve the patient's perception of the disease. Our study shows that patients need detailed and comprehensive information about the disease, especially about the side effects of drugs and traditional medicine. However, the relative strain on healthcare resources makes it difficult for patients to have their information needs met. Recent studies have shown that telemedicine and m-medicine may be potentially effective solutions [32, 33], but the acceptability and accessibility of this approach require further research. Environmental remediation must be carried out through the operation of community hospitals. Previous studies [34, 35] have found that the attitudes of family members, friends, neighbours and other people close to the patient towards the disease can influence patients' self-management behaviours, which is consistent with our study. Community hospitals should actively conduct public awareness campaigns on hypertension to promote a healthy lifestyle for all and to raise awareness among different groups of people about the prevention and control of hypertensive diseases. Community resources will be used to establish hypertension patient groups to facilitate mutual support, monitoring and encouragement among patients. In addition, through persuasive interventions such as improving communication skills, healthcare professionals can guide patients to value their family responsibilities (supporting older people and raising the next generation), understand the seriousness of the disease and increase their motivation to self-manage.

This study included young and middle-aged hypertensive patients from several countries to understand their common problems with blood pressure self-management and analysed the results using the COM-B model. However, only Chinese and English literature was included in this study, and literature in other languages was not included, so more attention should be paid in the future to the self-management of young and middle-aged hypertensive patients from other cultural backgrounds. Some trials were excluded because they looked at self-management of the disease, including young and middle-aged patients and patients of other ages. Therefore, we may not be able to provide a comprehensive picture of the attitudes of young and middle-aged hypertensive patients to self-management and the reasons for these attitudes. Finally, as only large published trials were included in this review, there may also be publication bias.

The following clinical recommendations are based on the results of this study. First, clinical healthcare providers need to be aware of the needs of young and middle-aged hypertensive patients for knowledge about hypertension and to develop detailed individualised management interventions for their patients. Second, we should emphasise the role of community service centers in preventing and controlling hypertension, disseminating knowledge about hypertension, and monitoring and encouraging young and middle-aged hypertensive patients to control their blood pressure. Finally, in the future, telemedicine, mobile healthcare and smart monitoring devices may be the preferred solution to improve self-management in young and middle-aged hypertensive patients. They not only provide patients with timely medical information but also play a supervisory role in disease management in patients' daily lives, thereby reducing the burden on medical resources. However, as the acceptability and exact implementation of these methods is unclear, further studies should be conducted in young and middle-aged hypertensive patients in the future.

Conclusion

This study explored the attitudes, challenges and motivations of young and middle-aged people with hypertension towards self-management. The results suggest that family responsibilities are a particular motivator for

self-management in young and middle-aged hypertensive patients. Analysing the results using the COM-B model, we concluded that meeting patients' knowledge needs, improving health professionals' communication skills and valuing the role of community hospitals are effective interventions to promote patient self-management. Future research will focus on how telemedicine, mobile healthcare and intelligent monitoring devices can be used to reduce the burden on medical resources.

Supplementary Information

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Additional file 1: ENTREQ checklist.

Additional file 2: PRISMA 2020 checklist.

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Competing interests
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