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ORIGINAL RESEARCH

Patient Participation in Medication Safety for Noncommunicable Diseases: A Qualitative Study of General Practitioners, Pharmacists, and Outpatients' Perspectives in Beijing

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Purpose: Our study aimed to explore the current status of patient participation in medication safety from the perspectives of general practitioners (GPs), pharmacists, and outpatients in Beijing, China.

Patients and Methods: A qualitative study using semi-structured in-depth individual interviews with GPs, pharmacists, and outpatients. Subjects were identified by purposive sampling until code saturation. Semi-structured qualitative interviews were conducted with GPs, pharmacists, and patients from community health service centers in three urban districts of Beijing, China. The interviews were transcribed verbatim and the text was analysed using thematic analysis techniques including familiarising with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report.

Results: A total of eight GPs, seven pharmacists, and 18 outpatients were interviewed. Data analysis led to the generation of five key themes: (1) mutual trust between patient and GP, (2) communication with healthcare professionals, (3) acquisition of knowledge about medication safety, (4) implementation of medication self-management at home, and (5) different attitudes toward participation in medication decisions. Patients participated in medication safety in multiple ways. However, insufficient knowledge about medication safety, lack of awareness of the patient's role in ensuring medication safety, shortage of consultation lengths, and being misled by some information were problems with patient participation in medication safety.

Conclusion: This exploratory study contributes to our initial understanding of patient participation in medication safety. There were still many issues and barriers in the process of patient participation. Appropriate policies and measures, such as providing various forms of patient education, ensuring sufficient physician-patient communication, giving full play to the role of pharmacists, and making judicious use of digital health tools should be taken to improve medication safety by fully utilising the role of patients.

Plain Language Summary: Medication safety is a significant concern around the world. Patient participation in the medication process is effective in reducing the incidence of medication errors and improving medication safety. However, the role of outpatients with chronic conditions in ensuring medication safety is often neglected. This study aims to explore the perspectives and experiences of GPs, pharmacists, and outpatients by qualitative interviews in Beijing, China. The study involved a series of interviews with eight GPs, seven pharmacists, and 18 outpatients living with noncommunicable diseases. The interview revealed five themes: (1) mutual trust between patient and GP, (2) communication with healthcare professionals, (3) acquisition of knowledge about medication safety, (4) implementation of medication self-management at home, and (5) different attitudes toward participation in medication decisions. The findings might help propose suggestions for patient participation in medication safety. Integrating these findings into future studies can help healthcare professionals formulate interventions and better support patients in participating in the medication process.

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Introduction

Medication safety is an ever-present concern for governments around the world, and that is defined as activities to avoid, prevent, or correct adverse drug events that result in unintended harm during medication use.[1] Adverse drug events (ADEs) refer to any harm that occurs in the course of drug therapy, including adverse drug reactions (ADRs) during regular drug use and any harm caused by medication errors. Medication error is a leading cause of avoidable harm in healthcare systems across the world. The cost of medication errors worldwide has been enormous, estimated at $42 billion per year, according to World Health Organization (WHO) statistics.[2] Furthermore, studies have shown a high incidence of ADEs in primary care settings, some of which are preventable.[3,4]

To improve medication safety, WHO has chosen "Medication Without Harm" as the theme for the third Global Patient Safety Challenge in 2017, which aims to reduce preventable serious medication-related harm by 50%.[5] It emphasised that physicians should empower patients, families, and their caregivers to actively participate in treatment or decision-making, ask questions, identify errors, and manage their medications.[6] In the same year, the Chinese Hospital Association set "ensuring medication safety" as a patient safety goal and encouraged patients to participate in patient safety management.[7] However, previous studies indicated that most patients rarely engage in safety-related behaviors or have generally low levels of participation.[8–12]

The rapid development of digital health tools offers new pathways for patients to participate in medication safety. Decision aids (DAs) are available as tools through websites and tablet applications that assist patients in improving their medication knowledge and participating in decision-making by demonstrating the benefits, harms, and burdens of medications and calculating the risk of disease episodes.[13,14] Additionally, the digital applications can store patients' medication lists, remind patients to take their medication as scheduled, and facilitate better communication between patients and physicians.[15–17]

In China, noncommunicable diseases (NCDs) have become a major cause of death and a disease burden for the population.[18] According to data released by the Chinese Health Care Commission, the number of people suffering from NCDs exceeded 300 million.[19] Medication is essential to prevent complications and improve the prognosis of NCDs. Most patients with NCDs take their medicines at home for long periods of time after picking them up from community health service centers (CHSCs). The National Healthcare Security Administration issued a directive that extended the prescription for eligible patients with NCDs to three months, reducing the frequency of patients' visits to health facilities and ensuring that patients' medication needs were met.[20] However, the problems of reduced patient-physician communication and the inability to keep abreast of patients' conditions and medication use have become more pronounced.[21–23] A randomised controlled trial study in China revealed that interventions for patients with cardiovascular disease, such as conducting motivational interviews and issuing medication lists and record forms, can promote patient self-efficacy and activation, in turn reduce the incidence of medication errors.[24] Therefore, patients are the potentially important line of defense against medication-related harm.

Current studies on patient involvement in medication safety in China mainly focus on tertiary hospitals, and the participation of community-dwelling outpatients in medication safety has rarely been discussed.[11,25–27] To fully exploit the role of outpatients with NCDs in medication safety, the perspectives of patients, pharmacists, and general practitioners (GPs) should be explored, and the content of patient engagement needs to be clarified. A qualitative study was carried out to understand the current status and issues of outpatient participation in medication safety in Beijing. The findings might be helpful in proposing suggestions for patient participation and formulating targeted interventions in the future.

Methods

Study Design

This exploratory study was conducted using a qualitative approach involving semi-structured interviews with a purposive sample of GPs, pharmacists, and patients with NCDs in Beijing, China. Semi-structured guidelines were used to guide the interviews, which were developed by an investigator based on a literature review about patient participation in medication safety.[28,29] Guidelines were reviewed and modified by a professor in the research team. Readability, reasonableness, and understandability were pilot-tested in two GPs, two patients, and one pharmacist. The study followed the Standards for Reporting Qualitative Research (SRQR) guidelines.[30]

Research Team

The research team consisted of a professor, an associate professor, three graduate students, and two GPs. The interviews were conducted by a graduate student who had been trained in qualitative interviewing. All researchers had previous experience in qualitative research.

Participants and Recruitment

Purposive sampling was used in the study. A three-stage sampling technique was used for patient, GP, and pharmacist recruitment. Six urban areas in Beijing are divided into the capital functional core area (*Dongcheng* and *Xicheng*) and the city functional expansion area (*Haidian, Chaoyang, Fengtai*, and *Shijingshan*). First, one district (*Dongcheng*) was randomly selected from the capital functional core area, and two districts (*Chaoyang* and *Fengtai*) were randomly selected from the city functional expansion area. Then, seven CHSCs were selected from the three districts (*Dongcheng, Chaoyang*, and *Fengtai*). The college where the research team is based is in charge of the general practitioners' training for CHSCs in Beijing and maintains a close collaborative working relationship with them. The study received support from the managers of selected CHSCs. Finally, GPs, pharmacists, and patients were recruited from the selected CHSCs. The managers of the selected CHSCs recommended GPs and pharmacists who met the inclusion criteria to researchers. Patients who met the inclusion criteria were recommended to the researchers by the GPs at the selected CHSCs. Researchers approached individuals as soon as they met the inclusion criteria to provide them with information about the study, including the purpose of the study, the role of the researcher in the study, and the benefits of participation. In addition, interviewees could receive a gift as appreciation for their time. The researchers arranged the time for the interview once individuals agreed to participate. The inclusion criteria of GPs and pharmacists included: (1) having worked in the CHSCs for at least five years before the research start date, (2) willingness to participate in the interview. Eligibility criteria of patients included: (1) one or more NCDs, (2) medication use for at least one month, (3) willingness to participate in this study. GPs recommended some patients who met the inclusion criteria and experienced ADEs. Informed consent was obtained from all participants. The sample size was determined by code saturation, which means that the range of thematic issues was identified and no more new codes arose.[31]

Data Collection

Individual in-depth interviews with GPs, pharmacists, and patients were conducted from May to July 2023. GPs and pharmacists interviews were conducted by Tencent meeting, and patient interviews were conducted in private rooms in CHSCs. Before the interview, the researcher explained the purpose of the research to the participants. Each interview lasted between 20 and 30 minutes and, with the consent of all participants, was audio-recorded and transcribed verbatim. The researcher remained respectful and neutral throughout the interview process.

The interview questions for GPs: (1) What do you think about the role of the patient in improving medication safety? (2) What factors do you think may influence patient participation in medication safety? (3) How do you feel about GPs and patients working together to decide on medication regimens? (4) What suggestions do you have for promoting patient participation in medication safety? (5) Are there any other comments that you would like to add?

The interview questions for pharmacists: (1) What do you think about the role of the patient in improving medication safety? (2) What factors do you think may influence patient participation in medication safety? (3) What can pharmacists

do to help promote patient involvement in medication safety? (4) What suggestions do you have for promoting patient participation in medication safety? (5) Are there any other comments that you would like to add?

The interview questions for patients: (1) Have you encountered any ADEs, such as medication errors or ADRs? If so, how did you manage the situation? (2) What measures can be taken to guarantee your medication safety? (3) Do you have any problems with the process of promoting your medication safety? (4) How was your current medication regimen developed or adjusted? Have you participated in the decision-making process? (5) Are there any other comments that you would like to add?

Data Analysis

Interview data were collated within 24 hours after each interview and imported into NVivo12. The interviews were analysed using thematic analysis, including familiarising with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report.[32] To ensure rigor, two researchers from the research team analysed the data separately. The researchers marked meaningful units for coding as they read the interview texts several times. The codes were organised into potential themes and all data related to each potential theme was gathered. Then, researchers reviewed the identified themes. Finally, the researchers refined the specifics and named each theme. If disagreements existed in coding and theme creation, the research team members discussed until a consensus was reached. Code saturation was achieved following interviews with six GPs, five pharmacists, and 16 patients. We continued two more interviews with GP, pharmacist, and patient respectively to ensure that no additional insights emerged.

Ethical Approval

The study was approved by the Medical Ethics Committee of Capital Medical University, Beijing, China (ethical review no. Z2023SY066). This research was conducted in accordance with the Declaration of Helsinki. Participants were informed about the study and consented to the anonymous information including "publication of anonymized responses/ direct quotes" being used for publication.

Results

A total of eight GPs, seven pharmacists, and 18 patients took part in the interviews, and the response rate was 100%. Participants' characteristics are shown in Table 1. Through the analysis of interviews with GPs, pharmacists, and patients, five themes related to patient participation in medication safety were identified: mutual trust between patient and GP, communication with healthcare professionals, acquisition of knowledge about medication safety, implementation of medication self-management at home, and different attitudes toward participation in medication decisions.

Mutual Trust Between Patient and GP

Mutual trust was the basis for successful patient participation, both patient trust of the GP and GP trust of the patient. GP trust in the patient was fundamental in empowering the patient to participate. Patient trust in the GP was a facilitating factor for parents to follow the GP's advice.

> The patient and the doctor need to trust each other fully, which is the basis for promoting patient participation. If the patient doesn't trust the doctor, he will subjectively negate the treatment plan and may stop taking the medication on his own. Pharmacist 1

However, patient trust in physicians could be a double-edged sword. Some patients might be utterly dependent on their GP's decisions and rarely actively seek further information about their medication.

> Because I trusted my doctor, I followed his advice completely. I didn't need to know more about the medication. Patient 1

> In another situation, patients may not participate if they trust the GP completely. GP 3

Table 1 Characteristics of the Study Participants

Items	GPs (n)	Pharmacists (n)	Patients (n)
Mean age (year)	39.1	39.3	69.9
Gender			
Female	6	4	11
Male	2	3	7
Education			
Primary school degree	0	0	2
Junior high school degree	0	0	6
Senior high school degree	0	0	5
Technical secondary school degree/Junior college degree	0	0	4
Bachelor's degree	4	6	1
Master's degree or above	4	1	0
Professional title*			
Junior	0	2	N/A
Intermediate	3	4	N/A
Deputy senior	2	1	N/A
Senior	3	0	N/A
Employed years			
≤10 years	2	1	N/A
11–20 years	4	3	N/A
21–30 years	2	3	N/A
NCDs			
Hypertension	N/A	N/A	14
Diabetes	N/A	N/A	11
Coronary atherosclerosis	N/A	N/A	6
Stroke	N/A	N/A	1
Hyperlipidemia	N/A	N/A	3
Chronic obstructive pulmonary disease	N/A	N/A	1
Chronic kidney disease	N/A	N/A	1
Number of NCDs			
1	N/A	N/A	4
≥2	N/A	N/A	14
Experienced ADEs			
Yes	N/A	N/A	8
No	N/A	N/A	10

Notes: *Resident physician, assistant pharmacist, and pharmacist are junior professional titles. Attending physician and pharmacist-in-charge are intermediate professional titles. Associate chief physician and associate chief pharmacist are deputy senior professional titles. Chief physician and chief pharmacist are senior professional titles.

Communication with Healthcare Professionals

Patients enjoyed communicating with their GPs about their health status, medication use, and allergy history during the consultation. Some patients would like to express their preferences for medication use (ie, medication price, therapeutic effect, and side effects) to GPs for decision-making. Additionally, patients communicated with the pharmacists about medication use and symptoms of ADRs. The Internet has become a popular way for patients to actively communicate with GPs at home. Patients would contact their GPs promptly when they had medication-related problems or experienced uncomfortable symptoms.

> I prefer imported drugs considering the better therapeutic effects and fewer side effects, and I will tell GPs during clinic visits. Patient 2

> Participation means telling the feeling after taking the medicine, for example, whether the medicine is effective and whether there are any side effects. Patient 6

> I would communicate with the GP about my current health status and allergies to some medicines before he formulates or adjusts my medication regimen. Patient 12

> Patients would communicate with their GPs if they experienced discomfort or symptoms of ADRs. GP 8

> WeChat groups and other apps are tools for GPs to communicate with patients. Patients could ask questions online, and GPs would respond promptly. Pharmacist 1

> Some patients would talk to us about the Chinese or Western medicines they were using or the uncomfortable symptoms they were experiencing. We sometimes found interactions between the medicines the patient was taking. Pharmacist 5

Lack of time during the clinical encounter and GPs' poor attitudes towards patients might impeded patients from communicating with their GPs about medication issues. Some GPs only explained drug usage and could not give more detailed instructions within the limited time. Patients were more likely to share information and discuss medicines if they received a positive attitude from their GPs.

> Some doctors were unfriendly, and they would become impatient when I tried to ask more questions. Patient 16

> The GP was so busy that he didn't talk to me much about medication, and I didn't ask too many questions during the consultation. Patient 17

> To ensure patients' active cooperation, GPs should communicate with them patiently and make them aware of their participation. GP 1

> Sometimes the clinical workload is so heavy that there is little time for in-depth communication with patients. Some GPs had a negative attitude toward patients, and patients were reluctant to ask more questions. GP 2

> With the heavy workload of outpatient clinics, the GPs had to manage patients quickly, so they might not be able to provide patients with detailed medication information. Pharmacist 1

Acquisition of Knowledge About Medication Safety

Patients acquired medication knowledge in a variety of ways, mainly by relying on physicians, medication instructions, and the Internet. Medication education was the most common method used to educate patients during clinic visits. During the education process, patients were informed by their doctors about the correct way to use the medication, including dosage and frequency of administration. Patients also actively participated in health education sessions on the development of NCDs and the importance of medication adherence in the CHSCs. Medication leaflets were also a source of information for patients on the safe use of medicines. Additionally, some patients learn about NCDs and medication through the Internet.

> The doctor provides health education and medication counseling to patients. They also give monthly lectures on controlling blood glucose, blood lipids, and blood pressure. Patient 2

> WeChat groups are the most critical communication and information transfer platforms among GPs and patients. I also read information sent by GPs on the WeChat public account. Patient 15

> The GPs explain the medication knowledge to the patient at the time of the visit. Patients also acquire knowledge through medication instructions or the Internet. GP6

The interviews revealed that a proportion of patients have an incomplete understanding of some essential aspects of medication safety, which can increase the risk of medication errors. Patients were confused with the exact dosing time, medication method, and storage methods, which increased the prevalence of ADRs. Lack of recognition of common ADRs, patients always feel overwhelmed, anxious, and frightened when ADRs occur. Besides, some patients had a limited understanding of NCDs and medication safety, leading to poor participation or compliance.

A few years ago, my stomach was often uncomfortable with acid reflux. The doctor told me that the symptom was caused by taking aspirin after meals. When I took the medicine before meals, the symptom disappeared. The experience was terrible, and the medicine was like poison if not taken properly. Patient 6

I don't pay much attention to the problem of medication safety. I don't think anything unsafe would occur, and it is not necessary to communicate with GPs about my medication. Patient 9

Patients need to know how to store their medicines. A patient once froze his medication, which should have been refrigerated. GP 2

Patients' perception of the disease and their emphasis on health and medication safety will influence their participation. If patients do not take their treatment seriously, they may not take their medication as prescribed or monitor the indicators. GP 4

Patients should be educated to recognise the symptoms of common ADRs to the medications they use. For example, hypoglycaemia is a common ADR that may lead to death if not managed promptly; some antihypertensive drugs may cause cough and ankle oedema, etc. Pharmacist 3

Some people with NCDs were unaware of the hazards of NCDs and complications. After taking the medication for a period of time, they would stop taking it on their own when they felt their symptoms were under control. Pharmacist 5

The vast amount of information may lead the patients to deviate from the knowledge that is the focus. Patients were unable to distinguish between valuable and misleading information. The risk of patients being misled by incomplete or inaccurate information from unreliable sources was frequent. Besides, medications purchased by patients from the Internet without a professional prescription may not be appropriate for their condition and could even cause harm.

One of my colleagues spent a lot of money on hypoglycemic agents from the internet, but the treatment was not very effective. Patient 15

Some patients ask me questions like the molecular structure of a drug that they don't need to consider. Patients are motivated to learn about medication safety, but some videos or popular science articles have taken them away from the key knowledge they need to focus on. GP 1

Implementation of Medication Self-Management at Home

Developing self-management strategies for patients is an important approach to reducing medication errors. Most patients took measures to avoid missing doses, overdosing, or taking the wrong medication, such as using pill boxes, keeping daily medications organised and in a visible place, or asking family members for help. Some patients monitored their condition and drug efficacy by recording daily medication use, blood pressure, and blood glucose. Wearable devices and mobile medical APPs were also used by patients for self-monitoring.

Every day, I record how many pills I take, my blood pressure, and my blood glucose value. If my blood pressure or blood glucose value rises, I show my records to the doctor and we analyse the cause together. Patient 2

I used to forget to take my medicines. Now I sort them and put them in a box. Patient 6

I use a wearable device to measure my blood pressure, and the results can be recorded in the mobile app. Patient 12

Different Attitudes Toward Participation in Medication Decisions

The majority of GPs and pharmacists were supportive of patient participation in medication decisions. They believed involving patients in decision-making could enhance patients' responsibility, reduce medical disputes, and promote the doctor-patient relationship. When multiple treatment options were available, some GPs informed patients about the advantages and disadvantages of medication regimens and encouraged them to make a choice. GPs would propose a treatment plan according to the patient's condition and preferences.

> Involving the patients in the decision-making process will improve their compliance, treatment outcome, and medication safety. GP 1

> If there are three dosing regimens, I will explain the advantages and disadvantages of each clearly to the patient and let him/her make a decision. GP 2

> When making treatment decisions for patients, I need to provide them with medication information and consider their preferences. GP 4

> Patients have the right to know and choose their medication regimen. Patient participation increases medication adherence, leading to better outcomes and fewer ADRs. Pharmacist 3

However, a few GPs believed that patients did not have enough medical knowledge and that engaging them in medication decision-making was unnecessary. In addition, some patients were unwilling to participate in medication decisions due to the insufficient information they received about their treatment or the lack of guidance from GPs. They preferred to follow their GP's advice rather than seeking information proactively.

> I have no medical knowledge and use whatever GPs prescribe. Patient 7

> Patients are not very knowledgeable about medical care, and I think the doctor should dominate the medication decision. GP 6

Discussion

Our findings explore the current status and challenges of outpatients with NCDs participating in medication safety. Five themes emerged from the qualitative analysis. Patients play an important role in ensuring medication safety and could participate in medication safety through various means. However, issues such as poor medication knowledge among patients, insufficient time for patient-physician communication, and low awareness of shared medication decision-making need to be addressed.

The concept of patient participation in medication safety is relatively unfamiliar and abstract to patients, leading to a potential lack of awareness and participation in medication safety. It is necessary to emphasise the acquisition of knowledge and skills related to patient participation. In 2019, WHO developed the patient engagement tool "5 Moments for Medication Safety", which allows patients to ask five critical questions at each moment and find answers with the help of healthcare professionals in the five key moments of "starting a medication", "taking my medication", "adding a medication", "reviewing my medication" and "stopping my medication".[33] Although the tool is not yet widely used in clinical practice, a few researches indicated that it could be applied at all levels of care and across all settings as a guideline to promote patient participation in medication management, improve self-efficacy, medication knowledge, and medication adherence, in turn reduce the risk of medication-related harm.[34,35] Additionally, most patients have a positive attitude toward the tool.[36] Therefore, physicians and patients should be informed about the tool, such as what it is and how to use it, through various forms of publicity.

The contribution of patients to medication decisions has often been underestimated.[37] The findings from this and other studies suggest that some patients do not actively participate in decision-making due to inadequate health education and over-reliance on healthcare providers. Although a number of patients were willing to share medication decisions with GPs, this may be hindered by physicians' overlook of the role and rights of patients. This study also found that not all GPs have the patience to communicate with their patients. It will take a long time for both patients and GPs to change from paternalistic to shared medication decision-making. The awareness of the role and responsibility of the patient in medication decisions should be raised among physicians and patients through social advocacy. GPs have important roles in guiding patients to participate in medication decisions. Patients should be encouraged by GPs to ask questions and express their thoughts to participate in the decision-making process.[38,39]

The results of this study displayed that some patients have inadequate knowledge of medication, especially regarding common side effects or ADRs, dosing time, and storage methods, which is consistent with the results of previous studies.[40,41] The majority of research indicated that the level of knowledge on medication has a significant impact on

medication adherence and safety in patients with NCDs.[42] Continuous health education through different ways has been the main modality to improve medication beliefs and compliance, prevent medical errors, and control chronic diseases by increasing patients' health literacy and self-efficacy.[43,44]

The lack of time for GPs to consult with patients during each visit was considered a barrier to improving patient participation in medication safety, given the shortage of GPs and the large number of outpatients in China.[45,46] With limited time, GPs are unable to communicate adequately with patients and provide them with detailed information on medication, which may lead to insufficient awareness of patient participation and knowledge of medication safety. Thus, more GPs should be trained to reduce the average ambulatory encounter volume per GP and increase the average consultation time per patient. According to the "Healthy China 2030" plan, there should be five qualified GPs per 10,000 residents by 2030.[47]

Digital health tools should be fully utilized to improve patient participation. WeChat, wearable devices, medication self-management apps, portable electronic reminder devices, and electronic adherence monitoring have been widely used in patients with NCDs.[48,49] These devices could remind patients to take and refill essential medications on time, facilitate doctor-patient communication, push medication information, monitor health, and make shared decisions with physicians.[50–52] However, the results of this study indicated that the risk of patients being misled by unreliable sources of information existed, which was consistent with the results of previous studies.[53,54] Thus, GPs ought to recommend reliable sources of information, such as WeChat groups for GPs and patients, public accounts of CHSCs, and family doctor apps. Furthermore, the regulation of mobile health technologies development should be strengthened to improve usability and validity.

Pharmacists play an active role in the long-term medication safety assessment and management of patients with NCDs. Effective communication between pharmacists and patients could improve patient adherence, medication safety and clinical outcomes.[55,56] However, pharmacists were not an integral part of most GP care teams in China.[57] Some pilot communities have initiated the pharmacy service model for NCDs management integrating community pharmacists.[58–60] The Shanghai study demonstrated that the provision of pharmaceutical care by community pharmacists could control blood pressure and improve patients' knowledge and skills in using medicines.[60] Thus, there is a need to encourage more pharmacists to be involved in medication management for patients with NCDs in CHSCs to reduce the burden on GPs and promote patient participation.

Strengths and Limitations

The main strength of this study is that the perceptions and experiences of participants were captured nuanced. It provides a deep and rich understanding of the current situation and issues of patient involvement in medication safety from different perspectives. In addition, to the best of our belief, this is the first qualitative study conducted in CHSCs in Beijing on the participation of outpatients with NCDs in medication safety. However, this study has some limitations. Firstly, the participants in this study were all from urban areas of Beijing, and it is unclear whether these findings apply to suburban populations. Secondly, the patients in this study were predominantly elderly, and their understanding might differ from that of younger patients. Additionally, although the sample size has reached the standard according to the principle of code saturation, a larger sample may be required to understand complex phenomena by meaning saturation. Finally, subjective interpretation by the researchers during the interpretation may lead to bias, although independent coding and frequent discussion strategies were used to mitigate potential bias.

Conclusion

This is exploratory qualitative research. The results of this study contribute to our initial understanding of the current situation and barriers to the participation of outpatients with NCDs in medication safety from the perspective of GPs, pharmacists, and patients. In the future, strategies should be informed to further promote patient participation in medication safety, including training more GPs to ensure sufficient time for physician-patient communication, integrating pharmacists into the family doctor team for patient medication management, providing various forms of education to improve patient awareness of participation and knowledge about medication safety, and using digital health tools judiciously to support patient participation.

Data Sharing Statement

Data are available from the corresponding author upon reasonable request.

Ethics Approval and Informed Consent

The study was approved by the Medical Ethics Committee of Capital Medical University, Beijing, China (ethical review no. Z2023SY066). This research was conducted in accordance with the Declaration of Helsinki. All methods were carried out in accordance with relevant guidelines and regulations. Written informed consent was obtained from all the participants. Participants were informed about the study and consented to the anonymous information including "publication of anonymized responses/direct quotes" being used for publication.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors disclose no conflicts of interest in this work.

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