Evaluation of Herbal Medicine Efficacy and Safety Claims from User's Perspective: A Qualitative Semi-Structured Interview Study in Abakaliki, Ebonyi State, Nigeria

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Received 8 April 2026; Accepted 28 May 2026; Published 13 June 2026

Direct Research Journal of Health and Pharmacology

Direct RESEARCH JOURNALS

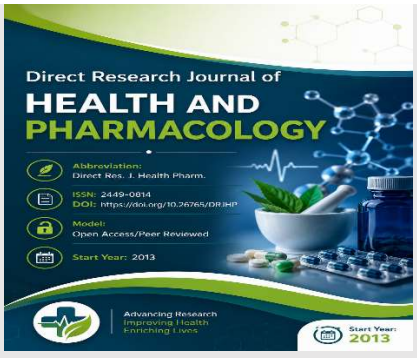
Vol. 13(1), Pp. 18-30, June 2026

Research Article
ISSN: 2449-0814
https://journals.directresearchpublisher.org/index.php/drjhp; https://www.ajol.info/index.php/drjhp

ABSTRACT

Herbal medicines remain widely used in Nigeria because of their affordability, accessibility, cultural acceptance, and perceived therapeutic benefits. However, increasing commercialization has raised concerns regarding the validity of efficacy claims and the safety of herbal products. This study explored users' perceptions of the efficacy and safety of herbal medicines among residents of Abakaliki, Ebonyi State, southeastern Nigeria. A qualitative study employing semi-structured in-depth interviews was conducted between July and September 2025 among adult herbal medicine users in Abakaliki. Participants were purposively recruited from churches and selected health centres, with maximum variation sampling used to ensure diversity in demographic characteristics and herbal medicine experiences. Eligibility criteria included being aged 18 years or older, resident in Abakaliki, and having used herbal medicine within the preceding 12 months. Data collection continued until saturation was reached, resulting in 35 participants (51.4% female; mean age 34.7 ± 12.1 years). Interviews were audio-recorded, transcribed verbatim, and analyzed using thematic content analysis. Herbal medicine use was deeply embedded in participants' health-seeking practices, with most reporting use since childhood. Key perceived advantages included accessibility and availability (n = 28), absence of side effects (n = 25), affordability (n = 22), and ease of self-medication (n = 18). Dissatisfaction with conventional healthcare was linked to high healthcare costs (n = 12) and long waiting times (n = 10). Family members (n = 24) and traditional healers (n = 15) were the primary sources of information. Perceived efficacy was highest for remedies obtained from relatives and trusted traditional practitioners, whereas commercially marketed products were more frequently associated with inconsistent outcomes. Safety concerns were mainly attributed to misuse, contamination, adulteration, and improper preparation rather than the remedies themselves. The findings demonstrate that herbal medicine use is shaped by accessibility, cultural beliefs, and personal experiences. Strengthening regulatory oversight, improving community-based safety education, and incorporating users' perspectives into policy development may promote the safe and rational use of herbal medicines.

Keywords: *Herbal medicine; traditional medicine; perceived efficacy; safety perceptions; qualitative research; Nigeria*



Citation: Ajaghaku, A. A., Mba, O. J., Iyanyi, L. U., Okoro-Akpandu, E., Eze, L. C. & Imakwu, I. I. (2026). *Evaluation of Herbal Medicine Efficacy and Safety Claims from User's Perspective: A Qualitative Semi-Structured Interview Study in Abakaliki, Ebonyi State, Nigeria. Direct Research Journal of Health and Pharmacology* Vol. 13(1), Pp. 18-30. https://doi.org/10.26765/DRJHP13947793

INTRODUCTION

Herbal medicines remain an important component of healthcare for a substantial proportion of the global population, particularly in low- and middle-income countries. The World Health Organization (WHO) estimates that up to 80% of people in developing nations rely on plant-based remedies as their primary source of healthcare (WHO, 2022). In Nigeria, the cultural integration of herbal medicine is deeply rooted in traditional belief systems, accessibility, affordability, and long-standing trust in indigenous therapeutic knowledge (Osemene and Elujoba, 2016; Abhadionmhen et al., 2025). This reliance has persisted despite the increasing availability of conventional biomedical services, reflecting both cultural continuity and perceived unmet needs within the formal healthcare system (Oyebode et al., 2016).

In recent years, the use of herbal medicines has expanded beyond traditional contexts to include commercially prepared herbal products sold in local markets, pharmacies, and media-promoted outlets (Ameh et al., 2018). Many of these products are advertised with strong claims of efficacy for a wide range of conditions, including malaria, diabetes, infertility, infections, and chronic pain. Such claims are commonly disseminated through word-of-mouth, radio jingles, market demonstrations, social media platforms, and endorsements by traditional healers (Ugwu et al., 2025). However, the credibility of these claims is rarely supported by rigorous scientific evidence, standardized formulations, or regulatory evaluation, leaving users to depend largely on personal experience, cultural beliefs, intuition, and testimonials when deciding whether to initiate or continue herbal medicine use (Oyebode et al., 2016; WHO, 2022).

Safety concerns have also been reported in relation to herbal medicines, including risks of adulteration, contamination, inappropriate dosing, herb–drug interactions, and potential organ toxicity (Osemene and Elujoba, 2016; Okonta and Enenebeaku, 2022). Despite these concerns, many users continue to express satisfaction with herbal treatments and may prefer them to conventional medicines due to perceptions of greater effectiveness, fewer side effects, cultural familiarity, and distrust of pharmaceutical products (Ameh et al., 2018; Abhadionmhen et al., 2025). Understanding how individuals interpret and evaluate efficacy and safety claims is therefore essential to explaining the widespread and persistent utilization of herbal remedies in contemporary health-seeking behavior.

Although research in Nigeria has extensively examined the phytochemical composition, pharmacological activity, and toxicological profiles of medicinal plants, relatively fewer studies have explored users' lived experiences, perceptions, and reasoning processes surrounding herbal medicine use (Oyebode et al., 2016). Yet, these perspectives are critical, as perceptions directly influence treatment choices, adherence patterns, disclosure to healthcare providers, and overall health outcomes (Abimbola et al., 2023). Abakaliki, the capital of Ebonyi State in south-eastern Nigeria, represents a context in which traditional healing practices and modern medical services coexist, yet there is limited systematic documentation of how residents perceive and judge claims related to herbal medicine efficacy and safety.This study therefore evaluated herbal medicine efficacy and safety claims from the users' perspective using a qualitative semi-structured interview approach in Abakaliki. By capturing lived experiences and personal interpretations, the study aims to generate context-specific insights that can inform public health education, enhance patient–provider communication, and support evidence-based policy on herbal medicine regulation and integration into primary healthcare.

MATERIALS AND METHODS

Study design

The research adopted a qualitative research design using semi-structured interviews to explore and compare the claims made by herbal medicine providers with the lived experiences of individuals who have used their services. Open-ended questions were employed to allow participants to express their viewpoints and experiences freely. The qualitative approach was chosen to gain in-depth understanding of participants' beliefs, perceptions, and personal narrative in relation to traditional herbal medicine practices. The questions were neutrally worded to avoid influencing responses. This study was reported in accordance with the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines (Dossett et al., 2021).

Study Setting

The study was conducted in Abakaliki, the capital city of Ebonyi State, located in South-Eastern Nigeria. Abakaliki is characterized by diverse socio-economic groups with widespread use of herbal medicines in both formal and informal health-seeking practices. Herbal medicines are commonly obtained from traditional healers, local markets, street vendors, and home preparations, making the setting suitable for exploring lived experiences with herbal remedies.

Study Population and Sampling

The study population consisted of adult residents of Abakaliki who had used any form of herbal medicine for health purposes within the preceding 12 months. Purposive sampling was used to recruit participants who could provide rich and relevant information based on their experience. Maximum variation sampling was also

applied to ensure diversity in age, gender, education level, occupation, and type of herbal medicine used (Nyimbili and Nyimbili, 2024). Participants were recruited purposively from church gatherings and selected health centres within Abakaliki, Ebonyi State, Nigeria. Members of the research team approached potential participants and briefly explained the purpose of the study. Individuals were screened for eligibility based on the inclusion criteria, including being aged 18 years or older, resident in Abakaliki, and having used herbal medicine for health purposes within the preceding 12 months. Eligible individuals who expressed interest in participating were invited to take part in the study and provided written or verbal informed consent before the interview commenced. Recruitment continued until data saturation was achieved.

Inclusion criteria

The following criteria were used in recruiting participants for the study: must be resident in Abakaliki, aged 18 years of age and above. Should be able to communicate in Igbo, English or pidgin English. Individuals who had used herbal medicine within the last 12 months and willing to provide informed consent and participate in an in-depth interview.

Exclusion criteria

Individuals who have not used herbal medicine or below 18 years of age. Individuals who were critically ill or unable to communicate effectively and individuals unwilling to be audio-recorded or to give informed consent.

Sample Size

A sample size of 20–35 participants was initially targeted, consistent with recommendations for qualitative interview studies (Hennink and Kaiser, 2021; Wutich et al., 2024). The final sample size was determined using the principle of data saturation. Data collection and preliminary analysis were conducted concurrently, enabling the research team to monitor the emergence of new information throughout the study. Recruitment continued until the research team agreed that no substantial new information, insights, or themes were emerging from the interviews and that sufficient depth and breadth of data had been obtained to address the study objectives. A total of 35 participants were ultimately recruited and interviewed.

Ethical Considerations

Ethical approval for this study was obtained from the University of Nigeria Teaching Hospital Health Research Ethics Committee (UNTH-HREC), Enugu, Nigeria (Approval Ref. No.: UNTH/HREC/2025/02/4053; NHREC Registration No.: NHREC/05/01/2008B-FWA00002458-IRB00002323) on 21 January 2025. Participants were informed about the objectives of the study, the voluntary nature of participation, and measures taken to ensure confidentiality and anonymity. Written or verbal informed consent was obtained from all participants prior to data collection. Written informed consent was obtained whenever possible; verbal consent was accepted for participants who preferred not to sign consent documents and was documented by the interviewer. Participants were informed of their right to decline participation or withdraw from the study at any stage without penalty or consequences. All interview data were anonymized, securely stored, and used solely for research purposes.

Research Team and Reflexivity

The interviews were conducted by trained research assistants who were members of the research team and academic staff within the Faculty of Pharmacy. The interviewers comprised both male and female academic staff members with experience in health-related research. Prior to data collection, the interviewers received training on qualitative interviewing techniques and were familiarized with the interview guide to ensure consistency and natural flow during interviews. The training focused on active listening, the use of open and emotionally neutral body language, rapport building, and appropriate probing techniques to encourage participants to elaborate on their experiences and perspectives. Interviewers were also trained to seek clarification when responses were unclear and to avoid leading questions that could influence participants' responses. The interviewers had no prior relationship with the participants before recruitment. Throughout data collection and analysis, the research team engaged in regular discussions to reflect on potential assumptions and biases arising from their professional backgrounds in pharmacy and to minimize their influence on data interpretation.

Data Collection

Data were collected between July to September, 2025 using a semi-structured interview guide developed based on literature and expert review (Kallio et al., 2016; Bhalla et al., 2023). Interviews explored: Reasons for using herbal medicines; perceived efficacy and outcomes; experiences with adverse effects or safety concerns; sources of information and trust and interactions with conventional healthcare providers. Interviews were conducted in a language preferred by the participant (English or Igbo), allowing respondents to express themselves naturally. To enhance credibility, prolonged engagement and rapport-building were undertaken at the beginning of each interview to ensure participants felt comfortable sharing their experiences. Member checking was performed by summarizing key points during and after the interview to confirm the accuracy of the researcher's understanding. Each interview lasted between 25 and 45 minutes and was conducted in a quiet, convenient location. All interviews were audio-recorded with permission and supplemented with field notes

documenting non-verbal cues and contextual details.

Data Management and Analysis

Audio recordings were transcribed verbatim. Igbo narratives were translated into English by bilingual researchers to maintain semantic accuracy. The transcripts were organized using NVivo**.** Data were analyzed using thematic content analysis following the steps of Sirwan et al. (2025) familiarization with data; generating initial codes; searching for themes; reviewing themes; defining and naming themes and producing the final report. Two independent researchers participated in the coding process, and discrepancies in coding or interpretation were discussed and resolved through consensus. For each key theme, both the range of responses and the predominant viewpoint were identified. In addition, an analytical approach was employed by quantifying the number of respondents who mentioned each theme (Bowling, 2022), thereby highlighting the issues that emerged most frequently among participants

RESULTS

Socio-demographic Characteristics of Participants

The 35 participants interviewed were made up of 17 (48.6%) males and 18 (51.4%) females from a wide age range. All were from Abakaliki Ebonyi State and of variable socio-demographic grouping (Table 1). The mean age was 34.7 ± 12.1 years (range: 20–65 years), with the majority belonging to the 20–29-year age group (48.6%). Business/trading was the most common occupation (31.4%), followed by farming (17.1%) and student/healthcare trainee status (14.2%).

Table 1: Socio-demographic characteristics of study participants (n = 35).

Characteristic	n (%)
Gender	
Male	17 (48.6)
Female	18 (51.4)
Age group (years)	
20-29	17 (48.6)
30-39	5 (14.3)
40-49	8 (22.8)
≥50	5 (14.3)
Age summary	
Mean age, years (SD)	34.7 (12.1)
Age range	20-65
Occupation	
Farmer	6 (17.1)
Business/Trading	11 (31.4)
Teacher/Civil Servant	4 (11.4)
Student/Healthcare Trainee	5 (14.2)
Hairdresser	3 (8.6)
Auxiliary Nurse	2 (5.7)
Security Personnel	1 (2.9)
Clergy	1 (2.9)
Painting Producer	1 (2.9)
Unemployed	1 (2.9)

Grouping of Themes and Subcategories

The themes and subcategories which emerged from the interview is grouped into six main headings. (i) Reasons for using herbal medicine and the extent of herbal medicine use. (ii) Where herbal medicines were accessed and sources of information about these herbal medicines. (iii) Effectiveness of herbal medicines used and how they relate or differs from the claims made by the vendors or providers. (iv) Safety of herbal medicines used as it relates to partakers belief and their experiences with the product. (v) Potential risks from use of herbal medicines and partakers level of involvement in pharmacovigilance reporting of adverse reactions. (vi) Perception about the use of herbal medicine and recommendations to others considering herbal medicine use. Selected quotes are presented to show direct evidence that supports the themes and to illustrate the subcategories that arose within these themes.

Theme 1: Reasons for Using Herbal Medicines and Extent of Use

Participants reported multiple and often overlapping reasons for using herbal medicines. These reasons clustered into three interrelated subcategories: perceived advantages of herbal medicines**,** dissatisfaction with orthodox healthcare**,** and cultural beliefs and traditional practices (Table 2). Most respondents cited more than one reason, indicating that herbal medicine use is shaped by a combination of practical, experiential, and sociocultural factors. The extent of use ranged from occasional, condition-specific use to long-term and routine reliance on herbal medicines as a primary form of healthcare.

Subtheme 1a: Perceived advantages of herbal medicines

The most frequently expressed reason for herbal medicine use was the perception that herbal products are natural and therefore safe. Participants contrasted herbal medicines with orthodox drugs, which were often described as “chemical” and potentially harmful to the body when used repeatedly or over long periods. “Hospital drugs are made of chemicals that can damage the body with time; that is why I prefer using herbal medicine since it is from nature and does no harm to the body.”*(RESP24, Female, 52 years, Farmer)*. “I use herbal drugs because they are prepared from leaves and roots of plants and are not mixed with chemicals which can damage the organs.” *(RESP22, Female, 27 years, Businesswoman).* Beyond perceived safety, respondents emphasized several practical advantages of herbal medicines, including accessibility, availability, affordability, and the ease of self-medication. Herbal remedies were commonly described as readily available within the local environment and usable without financial cost or professional consultation. “The herbs are around us. You don’t need to buy most of them; you can treat yourself even if you don’t have money.” *(RESP10, Male, 35 years, Farmer).* Some participants also viewed herbal medicines as offering broader

Table 2: Summary of themes and subcategories around reason for herbal medicine use and extent of use.

S/N	Perceived advantages of herbal medicine (35 participants)	Dissatisfaction with orthodox healthcare (18 participants)	Cultural beliefs and traditional practices (12 participants)	Extent of use of herbal medicine (30 participants)
1.	Natural: no side effect (25)	Long waiting times in hospitals (10)	Inheritance of herbal across generations (10)	Since childhood (24)
	Affordability (22)	High cost of consultation, tests and drugs (12)	Trust in ancestral and indigenous healing system (10)	Part of daily life (16)
2.				
	Easy self-medication (18)	Ineffectiveness of orthodox medicine (7)	Early exposure during childhood (7)	Intermittently for treatment of disease condition (25)
3.				
	Holistic treatment (15)	Poor attitudes of some health workers (8)	Perception that ancestral remedies have stood the test of time (12)	
4.				
	Accessibility and availability (28)		Cultural perception of certain illness as traditional (6)	
5.				
	No chemicals (17)		Resistance to abandoning tradition for western medicine (3)	
6.				

benefits beyond treating illness, including disease prevention and general body healing. “Because anything herbal is natural. So when you use herbal medicine for some sickness, you can get results depending on the type of sickness you are having.” *(RESP35, Male, 22 years, Fruit seller).* A strong preference for herbal medicines over orthodox drugs was expressed by some respondents. “Herbal drugs to me are very good. I usually take herbal drugs instead of this oyibo medicine… I don’t play with it.” *(RESP27, 65 years, Clergy).* Geographical proximity and convenience further reinforced herbal medicine use.

“The hospital is far, but the herbal medicine healers are around us within the village… you can go to them anytime without wasting your time.” *(RESP23, Female, 40 years, Businesswoman).*

Personal autonomy was also highlighted, with participants valuing the control they had over preparation and dosing.

“With herbal medicine, I am in control. I don’t need to see anybody before using herbs. I know how to prepare and use them and can adjust the quantity myself depending on how I feel.” *(RESP34, Female, 20 years, Student)*

Subtheme 1b: Dissatisfaction with orthodox healthcare

Dissatisfaction with orthodox healthcare was another major motivation for herbal medicine use. Participants described challenges such as distance to health facilities, long waiting times, perceived ineffectiveness of prescribed medicines, and concerns about drug quality and side effects.

“My reason for using herbal medicine… is because I have tried orthodox medicines that treat malaria and it didn’t work out for me, so I decided to try the herbal option.” *(RESP1, 45 years, Male, Civil servant)*

Some respondents attributed treatment failure to perceived poor manufacturing practices or the circulation of substandard medicines. *(RESP13, Female, 22 years, Healthcare trainee).*

“Some of the producers are no more using the actual content meant for that medicine… some reduce the quality or bring out expired medicines.” *(RESP8, Male, 36 years, Teacher)*

Similarly, others reported greater satisfaction with the outcomes of herbal treatment compared to orthodox drugs.

“Mainly it gives me what I want more than English drug.” *(RESP4, Male, 29 years, Security).*

Negative experiences with orthodox medicines, including those obtained from chemists, further reinforced reliance on herbal alternatives perceived as more trustworthy.

Subtheme 1c: Cultural beliefs and traditional practices

Cultural beliefs and long-standing traditional practices strongly influenced herbal medicine use. Many participants described herbal medicine as an inherited practice passed down through generations, accompanied by deep trust in indigenous healing systems.

“This is what we grew up with. My grandparents and parents used herbs and it worked very well for them, so there is no reason why I cannot use what has been proven over and over to be effective.” *(RESP30, Female, 45 years, Businesswoman)*

Some participants believed that certain illnesses are better treated with traditional remedies than with orthodox medicine.

“There are sicknesses that need traditional treatment, not injections. Hospital drugs can even make them worse.” *(RESP27, Male, 65 years, Retiree)*

Traditional healers were often viewed as knowledgeable authorities within the community, despite lacking formal biomedical training.

“Our traditional healers know these medicines better than doctors; it’s just that they didn’t go to university to obtain a certificate.” *(RESP27, Male, 65 years, Retiree)*.

Many respondents reported lifelong use of herbal medicines, often beginning in childhood through parental

or grandparental influence. “Since my mother gave birth to me, I’ve been using it.” *(RESP7, Female, 25 years, Unemployed)* “I can’t say exactly when I started using it because my parents have been using it on me since they born me.” *(RESP22, 27 years, Businesswoman)*. For a minority of participants, herbal medicine use was closely tied to cultural identity and pride, making abandonment in favor of western medicine unacceptable.

“Herbal medicine is part of our culture, we are known for it and we are proud of using and promoting it… their own works for them and ours works for us.” *(RESP27, Male, 65 years, Retiree).*

Theme 2: Access to Herbal Medicines and Sources of Information

Participants described diverse and overlapping pathways through which they accessed herbal medicines and acquired information about their use, this is summarized in (Table 3). These pathways were predominantly informal and community-based, with decisions shaped by trust, familiarity, accessibility, and prior positive experiences.

Subtheme 2a: Family and Intergenerational Transmission of Knowledge

Family members, particularly parents and older relatives, were the most frequently reported source of both herbal medicines and information regarding their preparation and use. Knowledge was commonly transferred within the household and embedded in routine caregiving practices.
“I got to know about herbal medicine from my parents. My mother prepares some herbs at home and tells us how to use them whenever we are sick.” *(RESP3, Male, 40 years, paint producer)*

“Most of the herbal medicines I use were introduced to me by my family. They have been using them for years.” *(RESP11, Female, 26 years, Hairdresser)*

Subtheme 2b: Peer and Social Network Influence

Friends and peers played an important role in recommending herbal medicines, particularly those perceived to be effective based on personal experience. Information sharing within social networks often emphasized testimonial evidence and observed outcomes.
“My friends usually recommend some herbal mixtures, especially when someone has used it and it worked for them.” *(RESP7, Female, 25 years, Unemployed)*
“I was introduced to herbal medicine through my friends. They told me where to buy it and how to take it.” *(RESP15, Female, 25 years, Auxiliary Nurse).*

Subtheme 2c: Traditional Healers as Sources of Expertise

Traditional healers were viewed as knowledgeable authorities who provided diagnostic assessment, treatment recommendations, and detailed instructions for herbal preparation and use.
“When the illness persisted, I went to a traditional healer who examined me and prescribed herbal medicine.” *(RESP2, Male, 46 years, Farmer).*

“The traditional healer explained how to prepare the herbs and how long I should use them.” *(RESP9, Female, 26 years, Hairdresser).*

Subtheme 2d: Market Vendors as Access Points and Informal Advisors

Market vendors served as readily accessible sources of herbal medicines and associated information. Participants commonly relied on vendors for guidance on indications and preparation methods, despite the informal nature of this information.
“I usually buy herbal medicine from the market. The sellers explain what it is used for and how to take it.” *(RESP6, Female, 29 years, Businesswoman)*

“The market woman selling the herbs told me it was good for stomach problems and showed me how to boil it.” *(RESP14, Male, 22 years, Student).*

Subtheme 2e: Digital and Online Information Sources

A smaller number of participants reported using the internet and social media platforms to seek information about herbal medicines. These sources were often used to supplement, rather than replace, traditional and interpersonal knowledge.

“Sometimes I search online to learn about herbs and their benefits before using them.” *(RESP14, Male, 22 years, Student)*
“I have seen information about herbal medicines on social media, and that also influenced my decision to try them.” *(RESP18, Male, 21 years, Student).*

Theme 3: Perceived Effectiveness of Herbal Medicines in Relation to Providers’ Claims

Participants’ narratives highlighted varied experiences regarding the extent to which herbal medicine providers’ claims aligned with actual therapeutic outcomes (Table 4). Perceptions of effectiveness were strongly shaped by the source of the herbal medicine**,** the level of trust in the provider, and the nature of the claims made**.** Three interrelated subthemes emerged.

Table 3: Summary of theme and subcategories on where herbal medicines were accessed and sources of information about these herbal medicines.

S/N	Source of herbal information and access to herbal medicine (35 participants)
1.	Parents and family members (24)
2.	Friends and peers (12)
3.	Traditional healers (15)
4.	Market vendors (8)
5.	Internet (6)

Table 4: Summary of theme and subcategories on Effectiveness of herbal medicines used and how they relate or differs from the claims made by the vendors or providers.

S/No	Providers' claims and perceived efficacy (35 participants)
1.	Close relative providers claims matched with experience (22)
2.	Trusted traditional medicine providers claims matched with experience (16)
3.	Commercial/internet providers claims matched with experience (4)
4.	Close relative providers claims mismatched with experience (2)
5.	Trusted traditional medicine providers claims mismatched with experience (0)
6.	Commercial/internet providers claims mismatched with experience (6)

Subtheme 3a: Alignment between Claims and Perceived Effectiveness in Trusted and Familiar Sources

Many participants reported that providers' claims were largely consistent with their experiences when herbal medicines were self-prepared, obtained from family members, or sourced from well-known traditional herbal practitioners within their communities. In such cases, trust was built through kinship ties, long-standing familiarity, and repeated positive outcomes over time.

"When it is prepared by someone we know in the family, what they say it will treat usually works. I have used it before and it helped me." *(RESP12, Female, 33 years, Businesswoman)*

"The herbalist in our community explains what the medicine is for, and most times it works exactly the way he said." *(RESP24, Male, 50 years, Farmer)*

For some respondents, effectiveness was framed as immediate and convincing. A 45-year-old teacher described rapid relief following the use of a self-prepared malaria remedy:

"To God be the glory immediately I took it I was free from malaria at that particular moment." (RESP1)

Similarly, participants using family-prepared remedies emphasized both speed and perceived superiority compared to conventional medicines:

"If I use the herbal medicine, no matter how serious the sickness will be it will just go… It works faster than English one." *(RESP5, Male, 26 years, Trader)*

In these contexts, claims were often not formally articulated but embedded within inherited knowledge and repeated practice**,** reinforcing confidence in both the remedy and the outcome.

Subtheme 3b: Conditional or Partial Effectiveness Despite Trusted Sources

Although trust enhanced confidence in providers' claims, some participants acknowledged that effectiveness was not always complete or sustained, even when remedies were obtained from family members. These accounts reflected a more nuanced understanding that herbal medicines could offer temporary or partial relief rather than definitive cures.

"Some herbal drugs will temporarily relieve the headache… but after, the headache will come back again." *(RESP8, Male, 36 years, Teacher).*

Such experiences suggest that while traditional claims may be broadly accepted within families, users also recognize variability in outcomes, indicating an experiential evaluation rather than unquestioning acceptance of claims.

Subtheme 3c: Divergence between claims and experienced effectiveness in commercial or impersonal Settings

In contrast, participants frequently reported a mismatch between providers' claims and actual effectiveness when herbal medicines were sourced from open markets**,** interact vendors**,** or unknown sellers**.** These settings were commonly associated with exaggerated or misleading claims, particularly in the absence of an established provider–user relationship.

"Some of them in the market will say the medicine can cure many diseases, but when I used it, it did not work as they claimed." *(RESP6, Female, 29 years, Businesswoman).* "When you buy it from someone you do not know, what they promise and what you experience

are usually different." *(RESP4, Male, 29 years, Security)*
Participants expressed skepticism toward such claims, emphasizing that lack of familiarity and accountability reduced trust and confidence in the products.

Subtheme 3d: Broad or universal curative claims and selective effectiveness

Several respondents highlighted a recurring pattern in which herbal medicine providers made broad or universal claims, suggesting that a single preparation could cure multiple, unrelated illnesses. While some participants acknowledged partial benefits, they emphasized that these claims were rarely fully realized in practice.

"They will say it can cure everything, but when you take it, it may cure one sickness and fail to cure another." *(RESP16, Female, 21 years, Midwife trainee).*

"The medicine helped my stomach problem, but the same one they said would also cure malaria did not work for that." *(RESP17, Male, 25 years, Private school worker).*
These accounts underscore participants' critical engagement with providers' claims, revealing an experiential process of validation in which effectiveness is assessed condition by condition rather than accepted wholesale

Theme 4: Perceived Safety of Herbal Medicines in Relation to Users' Beliefs and Lived Experiences

Participants' accounts revealed that perceptions of the safety of herbal medicines were deeply embedded in personal beliefs, cultural understandings, and experiential knowledge. While herbal remedies were largely regarded as safe, participants also articulated circumstances under which safety was perceived to be compromised. Four interrelated subthemes emerged.

Subtheme 4a: Perception of Inherent Safety Based on Natural Origin and Familiarity

A dominant belief among participants was that herbal medicines are inherently safe because they are "natural," particularly when derived from plants commonly consumed as food, such as fruits and leaves. This perception was reinforced by repeated personal use without noticeable adverse effects and by familiarity with the plants used in preparation.
"Most of these herbs are leaves and fruits we already eat as food, so I believe they are safe. I have used them many times and I did not experience any problem, especially when I prepare it myself." *(RESP31, Male, 57 years, Farmer)*

The natural origin of herbal medicines was thus equated with harmlessness, shaping participants' confidence in their safety.

Subtheme 4b: Trust in Source and Preparation as a Basis for Safety Assurance

Participants frequently linked safety to the source of the herbal medicine and the method of preparation**.** Remedies that were self-prepared, obtained from family members, or sourced from trusted traditional practitioners were perceived as safer due to confidence in ingredient selection, preparation processes, and hygiene.

"When the medicine comes from my family herbalist, I don't worry about side effects because I trust how it is prepared." *(RESP26, Female, 33 years, Hairdresser).*
This trust functioned as a protective lens through which potential risks were minimized or overlooked.

Subtheme 4c: Attributed Causes of Adverse Effects External to the Herbs Themselves

When adverse effects were reported, participants generally did not attribute them to the intrinsic toxicity of the herbs. Instead, perceived risks were linked to external or contextual factors, particularly in relation to commercially sourced products.
"The problems usually come from those herbs sold in the market. You don't know what they have added, and that is when people complain of reactions." *(RESP14, Male, 22 years, Student).*
Participants expressed concern about possible adulteration, contamination, and poor quality control, especially in open-market settings.

Subtheme 4d: Safety Risks Related to Misidentification, Environmental Contamination, and Dosage Uncertainty

Several participants highlighted practical challenges that could compromise safety, including difficulty in correctly identifying plant species, contamination during harvesting, and the absence of standardized dosing guidelines. "Sometimes people mistake one leaf for another because they look alike, and that can cause issues if the wrong plant is used." *(RESP32, Female, 50 years, Farmer)* "If the leaves are picked from dirty places, like near refuse or where animals pass, it can contaminate the medicine and cause sickness." *(RESP28, Male, 54 years, Teacher)*
"Some people take too much because they want it to work faster, and that is when side effects occur." *(RESP12, Feale, 33 years, Businesswoman)*
One participant emphasized dosage uncertainty as a central safety concern:
"Nobody is going to tell you the quantity you have to take… you are the one that will look at yourself and know the quantity depending on how weak or strong the illness is." *(RESP28, Female, 54 years, Teacher).*
These accounts reflect users' awareness of safety limitations arising from informal preparation practices and the lack of standardized guidance.

Theme 5: Perceived Risks of Herbal Medicine Use and Limited Engagement in Pharmacovigilance Reporting

Participants' accounts demonstrated an awareness that herbal medicine use is not entirely risk-free. However, perceived risks were largely attributed to misuse and contextual factors rather than to the inherent properties of herbal medicines. Alongside this recognition of risk, participants described minimal engagement with formal adverse drug reaction (ADR) reporting systems. Five interrelated subthemes emerged.

Subtheme 5a: Absence of Standardized Dosage and Reliance on Personal Judgment

A prominent risk identified by participants was the lack of standardized dosing for herbal medicines. Dosage decisions were commonly based on subjective assessments of illness severity, physical strength, or observed bodily reactions, a practice acknowledged to expose users to both inefficacy and toxicity. "Nobody is going to tell you the quantity you have to take… you are the one that will look at yourself and know the quantity depending on how weak or strong the illness is."*(RESP1, Male, 45 years, Teacher).* Some respondents explicitly linked excessive intake to harmful outcomes.

"When you took overdose of it, it can cause anemia… it will cause you dizziness and also the shortage of blood." *(RESP15, Female 25 years, Auxiliary Nurse)*. Similarly, warnings about dose-related adverse effects were described for specific remedies:
"They said if you take too much of the pawpaw leaf water, it will make you purge."*(RESP16, Female 21, Midwife trainee)*

Subtheme 5b: Misuse through Incorrect Indications or Routes of Administration

Beyond dosing errors, participants described misuse in terms of applying herbal medicines inappropriately or using them for conditions they were not intended to treat. Such practices were perceived as increasing the likelihood of harm. "People can misuse it, like when you are told to boil it and drink and you went and put it in your eyes, which is misuse." *(RESP1, Male, 45 years, Teacher).*
Others emphasized the risk of selecting the wrong herbal remedy for a given illness. "When you take the wrong one for the sickness you are suffering from." *(RESP4, Male, 29 years, Security).*

Subtheme 5c: Perceived Toxicity of Herbal Mixtures with Unknown Composition

Participants expressed particular concern about commercially prepared herbal mixtures with undisclosed ingredients, especially those obtained from untrusted vendors. These products were viewed as potentially harmful to vital organs. "Some of these mixtures, you don't know what they put inside, and that is how it can damage the liver." *(RESP33, Female, 25 years, Auxiliary Nurse)*. These concerns reflect anxieties about adulteration and the absence of quality control in informal markets.

Subtheme 5d: Severe Adverse Outcomes and Heightened Vulnerability in Pregnancy

Although less frequently reported, some participants described serious adverse outcomes attributed to herbal medicine use. One respondent recounted a miscarriage during pregnancy that healthcare providers linked to herbal medicine consumption. "I had a miscarriage and they said it's the herbal medicine I took that caused it."*(RESP34, Female, 20 years, Female).*

She further described additional adverse effects, including dizziness and what was locally described as "shortening the blood," underscoring concerns about the use of herbal medicines among pregnant women.

Subtheme 5e: Minimal Engagement in Formal Pharmacovigilance and Reliance on Informal Responses

Engagement with formal adverse drug reaction reporting systems was almost entirely absent. When adverse effects occurred, participants commonly responded by discontinuing the herbal medicine, adjusting the dose, or employing traditional countermeasures rather than reporting to healthcare professionals. "Next time you will not take it or you find a way to reduce the quantity you're consuming."*(RESP19, 25 years, Businesswoman)*
Traditional remedies were frequently used to counter perceived reactions: "If somebody takes herbs and it starts reacting… number one is to stop it, two look for red oil and take it." *(RESP20, 48 years, Businessman)*. Some participants viewed certain reactions as signs of therapeutic action rather than harm, further discouraging reporting. "Sometimes when rashes come out, people believe the medicine is working and bringing out the sickness." *(RESP20, 48 years, Businessman)*. Reluctance to disclose herbal medicine use to orthodox healthcare providers was widespread, driven by expectations of disapproval. "If you tell any doctor you are taking herbs, they will tell you to stop… so I don't tell them." *(RESP1, Male, 45 years, Teacher).* Where reporting occurred, it was informal and directed toward vendors for advice or symptomatic relief rather than for safety surveillance. "You go back to the vendor to explain the affects you are having… so he can provide a solution." *(RESP3, Male, 40 years, Painter)*

Theme 6: Perceptions of Herbal Medicine Use and Conditional Recommendations to Others

Participants' accounts reflected generally positive

perceptions of herbal medicine use, shaped by personal experiences, cultural familiarity, and perceived effectiveness. While many respondents expressed willingness to recommend herbal medicines, such recommendations were typically conditional and cautious, informed by awareness of potential risks and the limits of herbal treatment. Four interrelated subthemes emerged.

Subtheme 6a: Positive Perceptions and Willingness to Recommend for Common or Mild Conditions

Many participants described herbal medicines as beneficial and effective, particularly for common or non-severe illnesses. Personal success stories and long-standing cultural familiarity reinforced confidence and a readiness to recommend herbal remedies to others. "Herbal medicine is good and it works, especially for minor sickness, so I can recommend it to people, but they must know what they are using." *(RESP21, Male, 45 years, Farmer)*. These accounts indicate that endorsement of herbal medicine was grounded in experiential validation rather than abstract belief.

Subtheme 6b: Conditional Recommendations Based on Knowledge, Source, and Proper Use

Recommendations were rarely unconditional. Participants consistently emphasized the importance of correct identification of herbs**,** appropriate preparation and dosage**,** and sourcing from trusted individuals or experienced practitioners as prerequisites for safe and effective use. "I will advise someone to use herbs only from a trusted source or someone who knows the work very well." *(RESP13, Female, 22 years, Healthcare trainee)*. "It is better to start with small quantity and watch how your body will react before increasing it." *(RESP24, Male, 50 years, Farmer)*. This conditionality reflects participants' recognition of variability in herbal potency and user response.

Subtheme 6c: Emphasis on Caution, Moderation, and Response to Adverse Effects

Alongside positive endorsements, respondents demonstrated a cautious orientation toward herbal medicine use. They advised moderation, avoidance of indiscriminate use, and prompt discontinuation in the event of adverse reactions. "If after taking it you notice any strange reaction, the best thing is to stop it immediately." *(RESP28, Female, 54 years, Teacher)*
"Herbal medicine can help, but you have to be careful and not abuse it." *(RESP33, Female, 25 years, Auxiliary nurse)*. Such guidance suggests an internally developed risk-management approach rooted in observation and personal responsibility.

Subtheme 6d: Recognition of Limits of Herbal Medicine and Selective Use of Orthodox Healthcare

Participants acknowledged that herbal medicines are not suitable for all conditions. Several respondents advised against using herbal remedies for serious illnesses and emphasized the need to seek hospital care when symptoms persist or worsen. "I will not advise somebody to use herbs for every sickness; some conditions are better treated in the hospital." *(RESP1, Male, 45 years, Teacher)*. "People should not just take anything because they heard it worked for another person." *(RES24, Male, 50 years, Farmer)*. These views reflect a pragmatic and pluralistic health-seeking orientation in which herbal and orthodox medicine are viewed as complementary rather than mutually exclusive.

DISCUSSION

This study demonstrates that herbal medicine use in Abakaliki, Ebonyi State, Nigeria is a deeply embedded health practice shaped by an interplay of perceived benefits, cultural norms, lived experiences, and structural limitations within orthodox healthcare. Participants' engagement with herbal medicines was neither incidental nor singularly motivated; rather, it reflected a layered rationale in which beliefs about naturalness and safety, accessibility, trust in social networks, and pragmatic responses to healthcare constraints mutually reinforced one another. The extent of use, ranging from occasional reliance to routine, lifelong practice, highlights the centrality of herbal medicine within everyday health-seeking behaviour in this setting, consistent with reports from other parts of Nigeria and sub-Saharan Africa where traditional medicine remains a major component of primary healthcare (Oyebode et al., 2016; WHO, 2022).

A dominant driver of herbal medicine use was the widespread belief that "natural" equates to "safe." Participants frequently contrasted herbal remedies with orthodox medicines, which were perceived as "chemical," potentially harmful, and capable of causing long-term organ damage. Similar perceptions have been widely documented in Nigerian and African contexts, where fears of toxicity, side effects, and dependency associated with biomedical drugs encourage preference for herbal alternatives (Osemene and Elujoba, 2016; Ameh et al., 2018). While these beliefs promote confidence, autonomy, and continuity of use, they also contribute to an underestimation of potential risks, particularly in contexts where dosing, quality control, and safety evaluation are poorly defined.

Beyond perceived safety, herbal medicines were valued for their accessibility, affordability, and convenience. Participants emphasized the ease of sourcing remedies from their immediate environment or community networks, often at little or no cost and without formal consultation.

These factors were further reinforced by structural barriers within orthodox healthcare, including long waiting times, distance to health facilities, and financial constraints. Such findings align with evidence that healthcare system inefficiencies significantly shape reliance on traditional medicine, especially in rural and semi-urban settings (Abimbola et al., 2023; Abhadionmhen et al., 2025). Importantly, users highlighted the sense of control associated with herbal medicine use, including autonomy over preparation, dosage, and timing. While empowering, this autonomy transfers responsibility for safe use entirely to individuals, increasing vulnerability to misuse and adverse outcomes.

Dissatisfaction with orthodox healthcare further influenced patterns of herbal medicine use. Participants described perceived treatment failure, undesirable side effects, and mistrust in the quality of orthodox medicines, including concerns about expired or substandard drugs. These experiences reinforced preferences for herbal remedies believed to be more effective or reliable. Similar concerns have been reported in Nigeria, where poor regulation of drug distribution and experiences with counterfeit medicines undermine trust in biomedical care and strengthen confidence in familiar traditional therapies (Aina et al., 2020; Ugwu et al., 2025). These findings suggest that herbal medicine use is not solely rooted in cultural preference but is also a pragmatic response to systemic weaknesses within healthcare delivery.

Access to herbal medicines and information was overwhelmingly mediated through informal social and cultural networks rather than formal healthcare systems. Parents, older relatives, friends, traditional healers, and market vendors served as primary sources of both remedies and guidance, with family members acting as custodians of herbal knowledge through intergenerational transmission. Such pathways reinforce trust, normalize use, and reduce perceived need for professional consultation, a pattern well documented in qualitative studies across Nigeria (Oyebode et al., 2016; Ameh et al., 2018). Peer recommendations based on personal success stories further legitimized use, although this experiential sharing also facilitated inconsistent preparation methods and dosing practices. Traditional healers and market vendors occupied influential roles as both suppliers and advisors, with trust derived from cultural legitimacy rather than formal regulation, highlighting persistent gaps in standardization, quality control, and pharmacovigilance.

Digital sources such as the internet and social media played a secondary, complementary role, mainly used to reinforce or validate pre-existing beliefs rather than replace traditional knowledge systems. This selective integration of modern information reflects the resilience of culturally grounded health practices while simultaneously introducing risks related to misinformation, exaggerated claims, and unverified dosing guidance (WHO, 2022).

Perceptions of herbal medicine efficacy were closely linked to trust in the source and credibility of the provider. Remedies that were self-prepared or obtained from trusted family members or well-known traditional practitioners were associated with strong alignment between claimed and experienced effects. In these contexts, perceived efficacy was reinforced not only by symptom relief but also by confidence in preparation methods, accountability, and long-standing community validation. Conversely, herbal medicines sourced through commercial or impersonal channels, particularly open markets and itinerant vendors, were frequently associated with exaggerated “cure-all” claims and inconsistent outcomes. Participants’ skepticism toward such claims mirrors findings from other Nigerian studies that document tensions between traditional, condition-specific knowledge and the commercialization of herbal products without adequate regulation (Osemene and Elujoba, 2016; Ameh et al., 2018). Unrealistic claims heightened expectations and contributed to perceived treatment failure, even when partial benefit occurred.

Safety perceptions were largely belief-driven and grounded in familiarity rather than formal evidence. The assumption that herbal medicines are inherently safe was strongest when remedies were derived from edible plants or prepared by trusted individuals. Adverse effects did not necessarily undermine confidence; instead, harm was often externalized and attributed to adulteration, contamination, misidentification of plants, or misuse. This framing preserves belief in inherent safety while acknowledging contextual risks, a pattern previously described in African traditional medicine use (Abhadionmhen et al., 2025). Environmental contamination during harvesting, difficulty distinguishing morphologically similar plants, and lack of dosage precision were commonly cited concerns, reflecting informally recognized but poorly managed safety challenges.

Although participants acknowledged that herbal medicines are not entirely risk-free, risks were largely attributed to misuse rather than to the remedies themselves. Self-determined dosing, incorrect indications, and unknown product composition were perceived sources of harm, with reports of dizziness, purging, anemia, and generalized weakness illustrating the consequences of such practices. Reports of adverse pregnancy outcomes further highlight the vulnerability of specific populations, consistent with WHO warnings regarding herbal medicine use during pregnancy (WHO, 2022). Engagement with formal pharmacovigilance systems was virtually absent, with adverse reactions managed through self-regulation or informal consultation with vendors rather than reporting to healthcare professionals. Anticipated disapproval from orthodox practitioners discouraged disclosure, reinforcing secrecy and limiting opportunities for safety surveillance.

Some adverse reactions were reinterpreted as signs of therapeutic effectiveness, such as purging or rashes being viewed as evidence of disease elimination. Such interpretations normalize harm and further reduce the likelihood of reporting, a phenomenon previously described in studies of traditional medicine use in Nigeria

(Oyebode et al., 2016). Where reporting occurred, it remained informal and directed toward vendors for advice rather than contributing to broader safety monitoring. Participants' willingness to recommend herbal medicines was widespread but conditional, typically limited to minor or non-severe \illnesses. Recommendations emphasized trusted sources, moderation, and careful monitoring of bodily responses, reflecting experiential learning rather than formal guidance. This cautious endorsement supports the notion of pluralistic health-seeking behavior, where herbal and orthodox systems coexist and are selectively utilized based on perceived illness severity (Abimbola et al., 2023; Abhadionmhen et al., 2025).

This study has some limitations that should be considered when interpreting the findings. Although participant diversity was considered during sampling and information relating to educational background and duration of herbal medicine use was explored during the interviews, these variables were not systematically collected as structured demographic data for all participants. Consequently, they could not be reliably summarized and reported quantitatively. Future studies should incorporate comprehensive demographic data collection to enable a more detailed characterization of participants and facilitate exploration of potential associations between demographic factors and perceptions of herbal medicine efficacy and safety.

CONCLUSION

Overall, these findings indicate that herbal medicine use is socially endorsed and regulated through informal, experience-based norms rather than formal health systems. Beliefs about safety and efficacy coexist with awareness of risk, yet these risks are managed privately and rarely translated into pharmacovigilance engagement. Public health responses should therefore move beyond dismissive or prohibitive approaches. Strengthening healthcare systems, improving patient–provider communication, and delivering culturally sensitive education on safe herbal medicine use are essential. Engaging trusted community actors such as traditional healers and market vendors, alongside integrating herbal medicines into national pharmacovigilance frameworks, may enhance safety while preserving community trust. Aligning biomedical safety principles with existing belief systems offers a pragmatic pathway toward safer and more informed herbal medicine use.

Declaration of competing interest

The authors declare no competing interest.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the Tertiary Education Trust Fund (TETFund), Nigeria, for funding this research through the Institution-Based Research (IBR) intervention administered by David Umahi Federal University of Health Sciences, Uburu (Grant No. DUFUHS/VC/TETFUND/IBR/24/003). We also thank the management of David Umahi Federal University of Health Sciences, Uburu, Ebonyi State, Nigeria, for providing an enabling research environment, and the study participants and community members whose cooperation made this study possible.

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Appendix 1: COREQ (Consolidated Criteria for Reporting Qualitative Research) Checklist

COREQ Item	Reported	Location in Manuscript
Interviewer/facilitator	Yes	Research Team and Reflexivity
Credentials	Yes	Research Team and Reflexivity
Occupation	Yes	Research Team and Reflexivity
Gender of interviewers	Yes	Research Team and Reflexivity
Experience and training	Yes	Research Team and Reflexivity
Relationship established	Yes	Research Team and Reflexivity
Participant knowledge of interviewer	Yes	Recruitment/Consent procedures
Interviewer characteristics/reflexivity	Yes	Research Team and Reflexivity
Methodological orientation	Yes	Study Design
Sampling	Yes	Study Population and Sampling
Method of approach	Yes	Participant Recruitment
Sample size	Yes	Sample Size
Non-participation	No	Not reported
Setting of data collection	Yes	Data Collection
Presence of non-participants	No	Not reported
Description of sample	Yes	Table 1
Interview guide	Yes	Data Collection and Appendix
Repeat interviews	No	Not applicable
Audio recording	Yes	Data Collection
Field notes	Yes	Data Collection
Duration	Yes	Data Collection
Data saturation	Yes	Sample Size
Transcripts returned to participants	No	Not performed
Number of data coders	Yes	Data Analysis
Description of coding tree	Partially	Data Analysis
Derivation of themes	Yes	Data Analysis
Software	Yes	NVivo
Participant checking of findings	Yes	Data Collection
Quotations presented	Yes	Results
Consistency between data and findings	Yes	Results
Clarity of major themes	Yes	Results
Clarity of minor themes	Yes	Results

Appendix 2: Interview question guide.

Section	Main Question	Probing Prompts	Purpose
Introduction	Please introduce yourself (age, occupation, background).	"Tell me about your daily activities."	Establish rapport and context.
Use of Herbal Medicines	Can you tell me about the herbal medicines you have used recently?	Type, form (powder, roots, liquid), source, frequency of use.	Identify use patterns and familiarity.
	What influenced your decision to use herbal medicine?	Cost, cultural beliefs, family influence, dissatisfaction with hospitals.	Explore determinants of use.
Knowledge & Information Sources	How did you learn about the herbal medicine you used?	Friends, TV/radio, vendors, healers, social media.	Assess information pathways.
	Why do you trust or not trust these sources?	Experience, reputation, community endorsement.	Explore trust dynamics.
Perceived Efficacy	How effective was the herbal medicine for your condition?	Symptom changes, recovery time, comparison with drugs.	Understand perceived outcomes.
	Have you ever used herbal medicine that did not work?	Circumstances, expectations, perceived cause of failure.	Capture variations in perceived efficacy.
Safety & Adverse Effects	Have you experienced any unwanted effects after using herbal medicine?	Nausea, weakness, worsening symptoms, allergic reactions. what medicine, when did it start, how long did it last, what helped?	Assess safety concerns and adverse drug reactions
	How safe do you believe herbal medicines are compared to conventional medicines?	"Why do you think so?"	Understand safety beliefs.
Pharmacovigilance reporting of adverse reaction	After any adverse reaction from herbal medicine taken, what did you do? (seek care, stop medicine, tell family, report to someone?)	who did you tell? why or why not report formally?	Pharmacovigilance and reporting of adverse herbal drug reaction
Perception & Recommendations	What makes a herbal medicine "good" or "effective" in your opinion?	Strength, taste, purity, origin of plant.	Explore cultural quality markers.
	What advice would you give others considering herbal medicine use?	Dosage caution, checking source, combining with hospital treatment.	Gather user-informed recommendations.
Conclusion	Is there anything else you would like to share?	—	Allow final reflections.