Original Article

Use of Traditional Herbal Medicines during Pregnancy in Rwanda: Perspectives from Community Health Workers and Traditional Healers

Oliva Bazirete[1*], Denise Musengimana[2], Laetitia Bazakare Ishimwe[3], Vedaste Bagweneza[2], Madeleine Mukeshimana[2]

[1]*Midwifery, School of Nursing and Midwifery, College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda*
[2]*General Nursing, School of Nursing and Midwifery, College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda*
[3]*Monitoring and Evaluaton, College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda*

***Corresponding author:** Oliva Bazirete. Midwifery, School of Nursing and Midwifery, College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda. Email: o.bazirete@ur.ac.rw, baziretoliva@gmail.com. ORCID: https://orcid.org/0000-0002-8476-3448

Cite as: Bazirete O, Musengimana D, Ishimwe BL, Bagweneza V, Mukeshimana M. Use of Traditional Herbal Medicines during Pregnancy in Rwanda: Perspectives from Community Health Workers and Traditional Healers. Rwanda J Med Health Sci. 2025;8(2): 380-397. https://dx.doi.org/10.4314/rjmhs.v8i2.18.

Abstract

Background
The use of traditional herbal medicines during pregnancy is rising in African countries, including Rwanda, but their safety is questioned due to the lack of scientific development processes. Adverse outcomes have been reported, and literature generally advises against their use. Despite these concerns, many pregnant women continue to use them, and no specific study has examined their use in Rwanda.

Objective
This study aimed to explore the perspectives of community health workers (CHWs) and traditional healers regarding the use of traditional herbal medicines during pregnancy in Rwanda.

Methods
A qualitative exploratory design was used, with data collected through in-depth interviews among 30 CHWs and traditional healers from five Rwandan districts. Participants were purposively selected and consented to the study. The interviews were transcribed and analyzed thematically using Atlas.ti software version 23.

Results
Most participants acknowledged the use of traditional herbal medicines during pregnancy. However, their perspectives on the safety and potential adverse outcomes were contradictory. CHWs recommended against their use while traditional healers argued that these medicines are safe.

Conclusions
This study found that traditional herbal medicines are commonly used during pregnancy in Rwanda. Due to conflicting perspectives among participants, further research is needed to assess their safety and efficacy.

Rwanda J Med Health Sci 2025;8(2):380-397

Keywords: Community health workers, Perspectives, Pregnancy, Traditional herbal medicines, Traditional healers

Introduction

Pregnancy is a critical period with high societal expectations and significant maternal and foetal health challenges.[1,2] Among the various risk factors for pregnancy complications, the use of traditional herbal medicines warrants particular attention in African countries, including Rwanda. This is primarily because literature indicates that herbal medicine use during pregnancy and labour ranges from 34% to 80% in Sub-Saharan Africa, and is often associated with adverse obstetric outcomes.[3,4] Despite advancements in modern medicine, particularly in drug delivery systems and drug development,[5] traditional medicine remains widely used, especially in rural areas, where cultural beliefs and indigenous knowledge often promote these traditional herbal medicines.[3,6,7] It was reported that around 80% of people in rural areas in developing countries rely on traditional remedies during pregnancy to meet their health needs.[7]

In Western countries—such as Australia, the United Kingdom, and the United States—an estimated 60% of women use traditional herbal medicines during pregnancy and labour. In Sub-Saharan Africa, including countries like Uganda, South Africa, and Zimbabwe, the prevalence ranges from 34% to 80%.[3] This increasing trend of herbal medicine use among pregnant women has been documented in a literature review focusing on Sub-Saharan Africa, including Rwanda.[6]

Pregnant women often use traditional herbal medicines, believing these traditional herbal medicines can alleviate common pregnancy symptoms such as emesis gravidarum, promote the onset of labour, and enhance overall maternal health. Users of traditional herbal medicines also believe that these remedies improve lactation and contribute to the well-being of both the mother and the unborn child.[7–9]

However, the use of traditional herbal medicines during pregnancy presents significant health risks to both the mother and the baby.[7] Pregnancy itself increases vulnerability to the mother,[2] and these medicines often lack scientific validation regarding their composition, potential interactions with modern medications, and contamination risks[6]. Furthermore, many local traditional herbal medicines in Sub-Saharan Africa have never been botanically identified, which brings doubt about their safety.[4,6,8]

Without proper identification and safety assurance, the use of such traditional herbal medicines during pregnancy could lead to unforeseen consequences. Some of these consequences include premature labour, adverse reactions, and interactions with modern medications.[10,11] Preclinical studies also suggest potential embryotoxic or teratogenic effects, with similar risks possible in clinical settings due to insufficient research.[8] A systematic review and meta-analysis found that approximately half of women attending antenatal care use traditional herbal medicines. That systematic review and meta-analysis also highlighted that these medicinal plants are inadequately researched, and it is not possible to eliminate the potential risk of teratogenic effects.[12]

A retrospective study comparing neonatal outcomes found a higher prevalence of congenital abnormalities among babies born to women who used traditional herbal medicines compared to those who used pharmaceutical treatments.[8] This suggests potential health risks for pregnant women using traditional herbal medicines.

Another retrospective study supported these findings, revealing that the use of a local traditional herbal medicine in a rural African country was significantly associated with higher maternal morbidity and neonatal death or morbidity. Specifically, the odds of maternal morbidity were 28% higher among users of traditional herbal medicines, and the likelihood of neonatal death or morbidity was 22% higher compared to non-users.

The study recommended discouraging the use of traditional herbal medicines due to concerns about their safety.[13] A review of literature on herbal medicine use during pregnancy focusing on Sub-Saharan Africa emphasized the widespread use of traditional herbal medicines in the region, yet highlighting a remarkable scarcity of studies on their use during pregnancy, which presents a significant concern.[6]

In Rwanda, like in other parts of the world, the community uses traditional herbal medicines to treat conditions believed to be beyond the scope of modern medicine, particularly issues such as "poisoning" or "bad spirits" (Kurogwa and imyuka mibi in Kinyarwanda, respectively), which are understood culturally as ailments rooted in local beliefs. This practice is evidenced especially in a study conducted in the northern regions of Rwanda.[14]

To the best of the researchers' knowledge, no specific study has focused on the use of traditional herbal medicines by pregnant women in Rwanda. However, anecdotal evidence suggests that pregnant women in Rwanda frequently seek traditional herbal medicines from traditional healers. These women often use traditional herbal medicines during pregnancy and childbirth, and some may admit to this use when asked by healthcare providers during antenatal visits or at the time of delivery. Although there is no published evidence, pregnancy in Rwanda is generally regarded as a precious gift that must be protected through various approaches.

Consequently, Rwandan women tend to prefer traditional liquid formulations, believing they are natural and offer protection from bad spirits or poisoning or bewitchment (amarozi). This preference is largely driven by cultural beliefs shared within the Rwandan community and other regions globally.[7,8,14,15]

Despite global concerns about the safety of traditional herbal medicines especially during pregnancy, there remains a significant research gap, particularly in Rwanda, due to the limited number of studies exploring community perspectives on the safety of these traditional herbal medicines. Even the Rwandan Ministry of Health has highlighted that there are no sufficient studies conducted on the effectiveness and safety of traditional herbal medicines.[16] Consequently, this study aimed to address this gap by exploring the perspectives of community health workers (CHWs) and traditional healers in Rwanda on the use of these medicines. CHWs were included because they operate at the lowest level of the healthcare system and are directly involved in following up with pregnant women. Traditional healers were included due to their active role in providing various traditional medicines,[16] including those used during pregnancy.

Methods

Study design

This study employed a qualitative exploratory design. This design is typically used when studying new areas. An exploratory research design is a research design employed to investigate an undefined problem. It is carried out to gain a better understanding of the current problem, which is underexplored. Explorative research design, usually qualitative in nature, seeks to elucidate research questions rather than provide final and conclusive solutions to existing problems.[17] This applies to the study of traditional herbal medicines use among pregnant women in Rwanda, because to the best of the researchers' knowledge, no similar study was conducted in Rwanda.

Study setting

The administrative structure of Rwanda divides the country into four provinces (Western, Eastern, Northern, and Southern) and the City of Kigali. Each province and the City of Kigali are further subdivided into districts, which are then divided into sectors. Sectors are further subdivided into cells, which in turn are divided into villages, the smallest units of local governance.

The study was conducted in sectors of five districts across two provinces of Rwanda: Huye, Muhanga, and Nyamagabe in the Southern Province, and Musanze and Gakenke in the Northern Province. Three districts were randomly selected from the seven in the Southern Province, and two from the five in the Northern Province. Within each selected district, sectors were chosen purposively, with a focus on those located in remote areas. This approach was guided by evidence suggesting that approximately 80% of people in rural areas in developing countries rely on traditional remedies during pregnancy.[7] In addition, a study conducted in the Northern Province of Rwanda also highlighted the significant use of traditional herbal medicines among the rural population even if it did not target the use during pregnancy, [14] which served as another rationale to choose the rural area.
Therefore, researchers also anticipated that residing in rural area may contribute to the increased prevalence in the use of traditional herbal medicines during pregnancy, given the evidence indicating that around 80% of people living in rural area of the African region use traditional medicine.[7,16] This means that after a random sampling of district to ensure representativeness across the two provinces, the researchers then purposively selected rural sectors. Interviews with CHWs were conducted at health centres of the selected sectors, while interviews with the traditional healers were conducted in their community where they live or are based. Two rural sectors were chosen in each district.

Study population and sample size

The study involved 30 purposively selected participants, including 20 traditional healers and 10 CHWs. Regarding study site representation, 12 participants were from the Northern Province and 18 were from the Southern Province. Participants were recruited using a purposive sampling strategy. This approach was chosen due to its nature in ensuring a high-quality sample that would provide valuable insights into the phenomenon being explored, minimizing biases and increasing the reliability and trustworthiness of the findings.[18] The final sample size was determined based on the point of data saturation, when no new insights emerged from participants, as assessed through ongoing listening to interview audio recordings, reviewing transcripts, and reflecting on the content shared during interviews.

In Rwanda, traditional healers and CHWs have different roles in the community. On one hand, traditional healers provide traditional herbal medicines to different categories of individuals, including pregnant women. Although the Rwanda National Policy on Traditional, Complementary, and Alternative Medicine has been established, further steps are still needed to fully institutionalize traditional medicine within legal and regulatory frameworks. Currently, there is no clearly defined service package for traditional healers. However, the Rwandan Ministry of Health reports that approximately 80% of Rwandans also seek care from traditional healers based in the community.[16] On the other hand, CHWs are the lowest level in the healthcare system in Rwanda,[19] and they live in close proximity to pregnant women and traditional healers. These CHWs, particularly those in charge of maternal and child health (, play a key role in antenatal care, conducting pregnancy tests, and accompanying mothers to health centres for antenatal care and delivery.[19] Traditional healers, who deliver herbal medicines, were also well-positioned to contribute important perspectives in this area, given the professional nature of their role within the community, even though traditional healing is not yet fully institutionalized.[16]

A traditional healer is defined as an educated or layperson who claims ability or a healing power to cure ailments. He could have a particular skill to treat specific types of complaints or afflictions and might have gained a reputation in her/his own community or elsewhere. Traditional healer may base his power or practice on religion, the supernatural, experience, apprenticeship or family heritage.[20]

In this study, a traditional healer refers to any community-based individual who provides medicines that have not undergone conventional scientific development or approval. Their knowledge is typically inherited from ancestors or elders, passed down through generations, and learned from parents. This practice is often carried out by older individuals, sometimes referred to as wise women or men, and it is usually conducted at home in a specific room designated for such services. Pregnant women meet them in the community to get traditional herbal medicines.

Reliability and trustworthiness

To enhance the trustworthiness of the study, the researchers adhered to Lincoln and Guba's criteria: credibility, transferability, dependability, and confirmability.[21] Credibility was strengthened through prolonged engagement, where data collectors spent adequate time in the field to build rapport and gain a deep understanding of participants' perspectives. Reflexivity was also maintained, as the research team acknowledged potential biases during data collection, such as the assumption that traditional healers might not provide accurate information. Triangulation was employed by using multiple data collection methods, including interviews supported by detailed note-taking. For transferability, the researchers provided thick descriptions of the research context and setting, allowing readers to assess the applicability of the findings to other contexts. Sampling strategies were also clearly described, with justification for how the findings might be relevant beyond the study population. Dependability was addressed by thoroughly documenting research procedures and decisions and maintaining an audit trail that traced methodological changes and analytical processes. Confirmability was ensured through peer debriefing, where team members who were not involved in data collection or initial analysis reviewed the interpretations and findings to minimize bias. Reflexive journaling was also used throughout the study to document the researchers' reflections and potential biases. However, member checking was not performed due to the dispersed locations of participants, which made follow-up challenging.

To ensure the reliability of the data collection tools, a pilot study was conducted involving four participants: two community health workers (CHWs) and two traditional healers, who were not included in the final data collection. Based on the feedback and observations from the pilot as well as the study objectives, the tools were revised and refined accordingly.

Participants' recruitment, data collection procedure and tools

After receiving ethical clearance from the Institutional Review Board of the College of Medicine and Health Sciences, University of Rwanda, and permission from the study sites, data collection was conducted by research team members. A semi-structured interview guide with four open-ended questions, developed through a literature review, was used for in-depth interviews. In-depth interviews have been employed due to their nature in exploring sensitive or complex topics. They create a private and trusting environment where participants can share personal experiences without fear of judgment. This method encourages openness, making it ideal for participants who may be reluctant to speak publicly. Compared to other data collection methods, in-depth interviews yield richer, more nuanced data and a deeper understanding of sensitive topics.[22,23]

This is particularly relevant to traditional herbal medicine, which, although widely practiced, is not yet fully institutionalized. In this context, in-depth interviews provide participants with the space to share their views and experiences more freely. The following are the 4 primary questions and the corresponding secondary questions of the interview guide: (1) Can we start by discussing the most common traditional herbal medicines used by pregnant women in Rwanda,

and where do pregnant women typically find these traditional herbal medicines?, (2) How are these traditional herbal medicines prepared, and who is responsible for their preparation?, (3) What are the reasons for taking these traditional herbal medicines during pregnancy?

- Probe A: Let's discuss the different diseases or health problems that are treated with these traditional herbal medicines.
- Probe B: Do we have anyone in the room who has ever used these traditional herbal medicines during pregnancy? If so, could you please share the reasons for using them and the outcomes?

(4) What are your thoughts on the potential health complications for both the mother and the baby after taking these traditional herbal medicines?

Other secondary questions could emerge according to the responses from participants.

Data collection occurred between April and October 2024, with each interview lasting 30-45 minutes. A team of two researchers collected data, with one serving as the data collector and the other as the note-taker. After each interview, the same team took time to transcribe the data before returning to the data collection site. Due to ethical considerations, we ensured that participants did not have to travel from their residences to the study site. As a result, interviews with community health workers (CHWs) were scheduled at times that were convenient for them, typically when they were already at the health centres for their usual duties. Similarly, interviews with traditional healers were arranged only when they were fully available and at a time that suited their schedules. This approach led to data collection taking longer than initially anticipated.

Interviews were conducted in Kinyarwanda to ensure participants could express themselves comfortably, and transcripts were later translated into English for analysis and manuscript writing. Community Health Workers were recruited with the assistance of the Community and Environmental Health Officer (CEHO) at health centres in the study area. The CEHO helped the data collectors identify CHWs in charge of maternal and child health. These CHWs were then contacted by phone and invited to participate during their routine visits to the health center. Interviews were scheduled at a time convenient for them, conducted at health centres. For traditional healers, the CEHO also assisted in identifying eligible participants. After identifying them and obtaining their contact information, they were contacted by phone, and interviews were arranged at a time that suited them. Interviews were conducted at the locations where the traditional healers provide their services.

Data analysis and management

Collected data will only be shared for academic purposes, such as presentations to stakeholders or publication. No identifying information was included in the transcribed and analyzed data. Transcripts and audio recordings were stored on the principal investigator's (PI) password-protected personal computer, accessible only to the PI. Qualitative data were analyzed using thematic analysis with Atlas.ti software version 23. The steps of thematic analysis provided by Braun and Clarke, and described by Bagweneza et al.[21] were used, and included the following:

(1) Familiarization with the data

This step involved becoming deeply familiar with the data through repeated reviews. The coders thoroughly read all thirty transcripts multiple times to identify initia patterns and gain a comprehensive understanding of the content. This repeated engagement laid the foundation for generating initial codes.

(2) Generating initial codes

This step resulted in the development of broad preliminary codes, including: (1) commonly used herbal medicines by pregnant women in Rwanda, (2) sources of these herbal medicines, (3) preparation methods and individuals responsible for preparing them, (4) participants' views on

the reasons for using herbal medicines during pregnancy, (5) lived experiences regarding the effects or consequences of herbal medicine use during pregnancy, and (6) participants' perspectives on potential health risks of herbal medicine use for both mother and baby.

(3) Generating themes

Through a careful examination of the initial codes, broader patterns were identified across the dataset. Codes with similar meanings were grouped together to form themes and subthemes. These themes were not predetermined but emerged organically from the data. The final themes and subthemes are presented in Table 2.

(4) Reviewing potential themes

The emerging themes and subthemes were reviewed thoroughly to ensure internal coherence and relevance to the study objectives. Some themes were merged where appropriate, while others were excluded due to lack of relevance. This step resulted in three final themes and six related subthemes, all displayed in Table 2.

(5) Defining and naming of the themes

At this stage, the themes and subthemes were clearly defined and named in alignment with the study's objectives. Coders mapped specific content from the dataset to each theme and subtheme to ensure accurate representation of the participants' perspectives. These finalized themes guided the reporting and manuscript preparation.

(6) Producing the report

A comprehensive report of the findings was developed based on the final themes and subthemes, aligned with the study objectives. The research team collaboratively revised and refined the manuscript to ensure it met academic standards for publication.

Ethical considerations

The researchers adhered to ethical principles for research involving human subjects. Ethical clearance (Approval No. 349/CMHS IRB/2022) and verbal permission from the study settings were obtained before data collection. Before data collection began, the data collectors approached the Executive Secretary of the relevant sector with the ethical clearance obtained from the Institutional Review Board of the University of Rwanda, College of Medicine and Health Sciences. They explained the purpose of the study and requested permission to access the health centres and the community. Data collection only proceeded after receiving this permission. Participants were fully informed about the purpose and nature of the study and were made aware that their participation was entirely voluntary. They were also informed of their right to withdraw from the study at any point without any repercussions for themselves or their family members, and data collectors sought permission to record. Data collectors obtained consent from participants prior to conducting the interviews. Participants provided informed consent to participate and be recorded. The interviews were conducted in a safe environment, and confidentiality was maintained by assigning codes to participants, safeguarding identifying information, and securing the data.

Findings

This section outlines the main study findings, beginning with participants' characteristics, followed by the primary themes and subthemes identified.

Participants' characteristics

This section presents participants' characteristics. In terms of participant type, the majority were traditional healers, with 20 traditional healers and 10 CHWs participating. Most participants were in the 51 to 60-year age range (n=12). The majority were female (n=25), and most had completed only primary education (n=26). All participants were married. Regarding occupation, 18 were farmers, as noted in Table 1.

Table 1. Participants' characteristics

Participants' characteristics	n
Type of participant	
Community health worker	10
Traditional healer	20
Total	30
Age of participants (Years)	
30-40	4
41-50	8
51-60	12
61 and above years	6
Total	30
Gender	
Female	25
Male	5
Total	30
Level of education	
Primary Education	26
Secondary Education	4
Total	30
Marital status	
Single	0
Married	30
Total	30
Occupation of participants	
Farmer	18
Self-employment	4
No employment	8
Total	30

Themes

The following three main themes were identified during thematic analysis: a) Utilization of traditional herbal medicines among pregnant women; b) Preparation and safety of traditional herbal medicines for pregnant women, and c) Perceived health risks of using traditional herbal medicines during pregnancy, as it appears in Table 2.

Table 2. Themes and subthemes to report on

Themes	Subthemes
Theme one: Utilization of traditional herbal medicines among pregnant women	Commonly used traditional herbal medicines during pregnancy
	Reasons for using traditional herbal medicines during pregnancy
Theme two: Preparation and safety of traditional herbal medicines for pregnant women	Individuals involved in the preparation of traditional herbal medicines for pregnant women
	Perceived safety and hygiene in preparation methods of traditional herbal medicines for pregnant women
Theme three: Perceived health risks of using traditional herbal medicines during pregnancy	Participants' perspectives on potential consequences for mothers and babies associated with the use of traditional herbal medicines during pregnancy
	Participants' recommendations regarding the use traditional herbal medicines during pregnancy

Theme one: Utilization of traditional herbal medicines among pregnant women

This theme highlights participants' perspectives on the commonly used traditional herbal medicines by pregnant women and their motivations for using them. Understanding these views is crucial for identifying areas requiring further research on the safety of these medicines. Additionally, the motivations provided by participants should be thoroughly examined to determine their validity for such use.

Commonly used traditional herbal medicines during pregnancy

The participants acknowledged the use of various traditional herbal medicines during pregnancy. They particularly highlighted the use of clay, commonly known as "Ibumba" in Rwandan culture, which is believed to treat numerous diseases. Many Rwandans perceive it as a remedy for almost all diseases. However, "Ibumba" is not typically classified as a traditional herbal medicine.

It is more associated with the religious beliefs, where sellers claim it has purifying properties that cleanse the body and cure illnesses.

The other commonly mentioned traditional herb used during pregnancy was "Umuravumba" (Tetradenia riparia), which is widely used for respiratory issues, intestinal worms, and other ailments. Another frequently used remedy is "Umumanurankuba," translated as "thunder descender," which is believed to aid in the expulsion of the placenta. Participants also mentioned other traditional herbal medicines used by pregnant women to address common pregnancy-related conditions or belief-based issues, such as umugombe, Umuyobora, Gaperi and Umudasamwa. However, all these medicines have not been botanically identified and we could not have their English translation.

"What I know about herbal medicine is something called "ibumba" (clay). It is something that looks like a stone, a pregnant woman uses it in order to not face any problems regarding her pregnancy." Northern Province, CHW

"The most commonly used traditional herbal medicine is "Umuravumba" which treats many conditions." Southern Province, CHW

"Some traditional herbal medicines are for consumption, and some are introduced in vagina in cases like placenta retention, using a hand to insert umumanurankuba and umugombe. Also, Umuyobora and umumanurankuba mixed with porridge are used to stop contractions in preterm labour." Northern Province, Traditional healer

"The herbal medicines that are mostly used in the Rwandan tradition are "Gaperi, Umudasamwa and Umumanurankuba" which are mostly used by pregnant women."

Southern Province, Traditional healer

However, some participants admitted that while these medicines are widely used, they could not recall their specific names. This is partly because traditional healers often keep the details of these medicines secret and use terms that are not easily understood by most people.

"Generally, the traditional herbal medicines used by pregnant women are herbal, but the specific types are often not known unless you are a traditional healer, as they are typically kept secret." Northern Province, CHW

Reasons for using traditional herbal medicines during pregnancy

During the analysis of in-depth interviews with traditional healers and CHWs, it was found that the most common reason for using traditional herbal medicines during pregnancy is to protect against bewitchment, which could harm the mother, the baby, or both. For example, a condition known as "Amahembe," translated into "horns," is believed to be a form of bewitchment treatable with herbal medicines. Participants emphasized that using these medicines is seen as essential to prevent adverse pregnancy outcomes, a belief shared by many families in the Rwandan culture. Additionally, some people suspect they may have been bewitched, leading to a condition called "Kumanika inda" (or "Hanging a pregnancy"). In Rwandan culture, this condition is thought to occur when a pregnant woman is bewitched and cannot deliver, meaning she will carry the pregnancy indefinitely. Traditional herbal medicines are used to help bring the pregnancy to term and ensure a safe delivery without requiring a caesarean section. Finally, there are participants who mentioned they use some traditional herbal medicines such as "Umuyobora" to prevent premature delivery.

"The reasons they take this medicine include cases where people with ill intentions take your clothes and use them for witchcraft. There are also women who experience excessive bleeding and are unable to stop it; I give them medicine to stop the bleeding. Many illnesses are due to poisoning." Northern Province, Traditional healer

"…Some believe they are cursed or bewitched and think traditional herbal medicines will protect them or their unborn child. Others, influenced by traditional beliefs, think that no pregnant woman should give birth without taking these medicines. They often seek traditional herbal medicines because they believe that modern medicine does not treat what they call "amahembe". For instance, they might think that a baby was born with a condition due to some ancestral or spiritual issues due to these beliefs." Northern Province, CHW

"Pregnant women mainly use traditional herbal medicines to push their wombs which were hanged by witches, and this protects them from giving birth through cesarian section." Northern Province, Traditional healer

"In case of preterm labour, we give umuyobora to mix with water for bathing or with oil lotion. This helps the medicine pass into the bloodstream to reach the baby in the womb and alleviate abdominal and back pains…" Northern Province, Traditional healer

Some participants also mentioned using traditional herbal medicines for pregnancy-related conditions such as nausea and vomiting, which are typically managed by modern medicine. They pointed out that pregnant women may use a variety of traditional medicines at different stages of pregnancy, targeting specific symptoms to ensure a healthy pregnancy. Additionally, it was noted that pregnant women sometimes use both traditional herbal and non-herbal medicines, such as clay "Ibumba," to treat a condition called "Ifumbi." This term refers to genito-urinary infections, such as vaginal discharge, which is commonly treated with modern medicine.

"When a pregnant woman experiences nausea and anorexia in the first two to three months, we use inyunyusi and nyiramatwi. If these symptoms persist in the third and fourth months, we use umuyobora and inyunyusi. For complicated labour, we use umumanurankuba and umuyobora to deliver the placenta. Umuyobora and umumanurankuba mixed with porridge are used to stop contractions in preterm labour. To promote the good health of the unborn baby, we apply iboneranzobe on the mother's abdomen." Northern Province, Traditional healer

"….clay is used for treating the disease which is called "ifumbi" and urinary tract issues. About delivery, some pregnant women use the following herbal medicines: umuhurura, igifashi and gutwikumwe that they apply on lower abdominal to help the woman deliver without delaying even if she was poisoned. There is a time where they use umuravumba for treating cough." Southern Province, CHW

Finally, some participants mentioned using traditional medicines due to the influence of family members, particularly mothers-in-law, who encourage their daughters-in-law to use these medicines. They often do so based on their own experiences during pregnancy, believing that they had positive outcomes because they used these traditional medicines

"… it comes from their elder relatives, like their mothers-in-law, who convince them that the traditional herbal medicine is what helped them and is more effective than the modern ones. When you ask pregnant women why they took traditional herbal medicine, their answer is that their mother-in-law gave them the medicine so that it will make it easier for the baby to come out." Northern Province, CHW

Theme two: Preparation and safety of traditional herbal medicines for pregnant women

This theme explores how traditional herbal medicines used by pregnant women are prepared, with a focus on safety regarding preparation standards and the individuals involved.

Two subthemes emerged: (a) the individuals involved in the preparation of traditional herbal medicines for pregnant women, and (b) the perceived safety and hygiene in preparation methods of traditional herbal medicines for pregnant women preparation.

Individuals involved in the preparation of traditional herbal medicines for pregnant women

During the analysis of interviews with participants, the majority revealed that traditional herbal medicines are primarily prepared by older family members, particularly parents or parents-in-law, who may prepare them for pregnant daughters or daughters-in-law. However, some participants mentioned that these medicines are prepared by traditional healers, who also dispense them. A few participants also noted that pregnant women may prepare these medicines themselves. The following quotes support these views:

"Traditionally, it is prepared by elderly people in the community, such as a mother preparing for her daughter or daughter-in-law. Traditional healers who are experienced in herbal medicine also prepare it." Northern Province, Traditional healer

"These herbal medicines are prepared by the traditional healers; they take different traditional herbal medicines, and they blend, thereafter they mix them with clays and water." Southern Province, CHW

"Those herbal medicines are prepared by the pregnant woman themselves. They go to bring them in the forest, they compound them, and they put them in the envelop." Southern Province, CHW

Perceived safety and hygiene in preparation methods of traditional herbal medicines for use by pregnant women

Both CHWs and traditional healers agree that most traditional herbal medicines are crushed, boiled or filtered for administration to pregnant women, although some medicines do not require boiling. However, opinions on the safety of these preparations differ. Most CHWs expressed doubts about the safety of these medicines, citing concerns over preparation hygiene. In contrast, traditional healers were confident about their safety.

"…Traditional healers tell us (CHWs) that using traditional herbal medicines during pregnancy is a traditional practice, but they prepare them from herbs, and they take each particular herb, hoping that it will be useful in their time and mix it. When we asked them how they filter it, they tell us that they grind it into powder and then soak it in water or give it to someone to drink it in a porridge or to apply it on the stomach." Northern Province, CHW

"…. Traditional herbal medicines are not passed through the designated tools to be tested for the quality of the medicine. That's why we (CHWs) tend to disagree with them because they are not well tested." Northern Province, CHW

"……First, I clean the pot thoroughly. Then, I boil water until it reaches boiling point. After boiling the water, I add it to the pot and let it warm up slightly. Next, I wash the medicinal plants. Once clean, I place them in the boiling water and continue heating until the mixture boils again. After boiling, I let it cool down before straining it through a tea filter. I then administer the filtered medicine, either directly or mixed with chlorinated water." Southern Province, Traditional healer

"We clean the herbs twice with water, dry them for a while, then blend them. The blended herbs are placed over a clean sack for drying and protection from the soil. After drying in the sun, we grind and filter the flour. A very small quantity is given to the woman mixed with a drink, scrub on the abdomen, or mix with lotion depending on the age of pregnancy." Northern Province, Traditional healer

Theme three: Perceived health risks of using traditional herbal medicines during pregnancy

This theme explored participants' views on the potential risks associated with the use of traditional herbal medicines during pregnancy. Two subthemes emerged: (a) Participants' perspectives on potential complications for mothers and babies associated with the use of traditional herbal medicines during pregnancy and (b)

Participants' recommendations regarding the use traditional herbal medicines during pregnancy

CHWs and traditional healers shared diverse perspectives regarding the health risks these medicines pose during pregnancy.Participants' perspectives on potential complications for mothers and babies associated with the use of traditional herbal medicines during pregnancy. Two categories of participants provided diverging perspectives on this component. On one hand, almost all CHWs clearly stated that the use of traditional herbal medicines during pregnancy is associated with adverse outcomes for both mothers and babies. They highlighted that these medicines may cause a range of complications due to the lack of scientific processes, proper approval, and accurate dosage in their preparation and administration. According to them, these issues can result in serious complications such as miscarriages, congenital anomalies, stillbirths, or even the death of the mother, baby, or both. Details are provided in the quotes below:

"….We often see that traditional herbal medicines cause more harm than benefit. They may lead to complications such as miscarriages or problems during delivery. They can cause significant issues due to the unregulated preparation and dosage." Northern Province, CHW

"The effects of using traditional herbal medicines can be significant for both the mother and the child. If a pregnant woman uses them in the later stages of pregnancy, they can affect the child's health. If she uses them in the early stages, the child may be at risk of being born with anomalies." Northern Province, CHW

"There are some complications which can happen such as stillbirth and abortion due to those herbal medicines that they have taken." Southern Province, CHW

On the other hand, traditional healers argued that traditional herbal medicines do not cause any harm; instead, they are beneficial for pregnant women, promoting positive pregnancy outcomes. Some even testified that they personally used these medicines during their own pregnancies without experiencing any negative consequences.

"These pregnant mothers experience no problem, because even when they go to the hospital and delay to deliver, they may not worry because they are aware they have been treated traditionally (BABAZINGUYE)". Southern Province, Traditional healer

"….There are benefits of traditional herbal medicines. We help pregnant women, and they often have quicker and easier deliveries. Those who use our medicines tend to have healthier babies and do not face prolonged labour. Mothers often return to thank us for our assistance." Northern Province, Traditional healer

"I couldn't eat anything when I was pregnant, people recommended me to an elder who gave an herb known as <<ubwiruru>>and told me to put it in my food or porridge, I did as he said and from that day, I regained my appetite. That's why I believe traditional healers are effective and important." Northern Province, Traditional healer

"So far, on my knowledge I have never witnessed any negative consequences, I have been using such herbs in my six pregnancies and I delivered healthy babies without a problem." Northern Province, Traditional healer

Participants' recommendations regarding the use traditional herbal medicines during pregnancy

The analysis of interviews with CHWs and traditional healers revealed diverging perspectives. Most CHWs advised against the use of traditional herbal medicines during pregnancy because of potential health risks for both mothers and babies. They recommended to conduct awareness campaigns to educate the community about the dangers of these medicines and train CHWs to enhance their knowledge so they can better educate others. However, a few suggested conducting research about traditional herbal medicines to assess any potential benefits.

"We would appreciate more training and awareness campaigns to educate the public about the risks of traditional medicine. Traditional healers should also be regulated to ensure they operate within a monitored framework." Northern Province, CHW

"I think that healthcare providers should also give community health workers training to make us aware of the dangers of using these drugs and increase our knowledge so we can teach people before they conceive." Northern Province, CHW

"….As researchers, you can approach these traditional healers to learn about the kinds of medicines they make. This way, the country can conduct research on these medicines to see if they could benefit Rwandans." Southern Province, CHW

Most traditional healers recommended that they be approached and supported, as they are often overlooked, despite knowing effective medicines for various conditions. Others suggested that pregnant women should seek care from the recognized traditional healers to get trustworthy services.

"……..What I wish is that authorities can approach traditional healers and see if they can support them because sometimes, they are not known yet they know some effective medicines. They really treat people." Northern Province, Traditional healer

"It is better to consult a recognized traditional healer. Sometimes traditional healers may tell you to drink medications which are for local application, and you get consequences. We don't have equal knowledge, sometimes when a woman calls me when she failed to deliver at the hospital, and I give her some of my herbal medicine, she then gives birth safely." Northern Province, Traditional healer

Discussion

This study aimed to explore the perspectives of CHWs and traditional healers on the use of traditional herbal medicines during pregnancy in Rwanda. It has been identified that they have diverging views regarding their use.

The first theme, "Utilization of traditional herbal medicines among pregnant women" highlighted the widespread use of these medicines, driven by various beliefs and influences. One of the main reasons for their use is the belief that pregnant women may be bewitched or subjected to supernatural forces. Many women take these medicines in the hope of ensuring positive pregnancy outcomes for both the baby and mother, assuming that herbal medicines are more natural and safer than conventional medicines.

Even women who do not believe in witchcraft may still use these medicines, considering them harmless and effective in managing common pregnancy symptoms, because they are natural. Additionally, some women reported being influenced by family members, such as parents-in-law, to take traditional herbal medicines. However, this reliance on unregulated herbal medicines poses significant risks. Since no traditional herbal medicines have been approved by the Rwandan Ministry of Health for use during pregnancy, women face potential complications such as premature delivery and other adverse outcomes.

These findings are consistent with other studies, which indicate that cultural beliefs

and the perception of herbal medicines as natural and safer alternatives are key factors driving their use among pregnant women.[8,15,24–26]

However, a scoping review conducted by Adamolekun and team revealed that the primary reason women use traditional herbal medicines is the lack of accessibility and affordability of modern conventional medicine.[27] This contrasts with the findings of this study, which did not identify any instances where traditional herbal medicines were used due to the unavailability of modern medicine. This difference may be attributed to variations in study settings, as Rwanda offers affordable and accessible modern conventional medicines, unlike the contexts described in the review.

The second theme, "Preparation and safety of traditional herbal medicines for pregnant women," explored the individuals involved in preparing these medicines and their adherence to safety and hygiene. The findings revealed a lack of standardized preparation methods, as these medicines are often prepared by older family members, pregnant women themselves, or traditional healers. Concerns were raised about poor hygiene during preparation, casting doubt on the safety of these medicines.

This aligns with studies indicating that adulteration and unskilled personnel contribute to the unreliability of traditional herbal medicines.[15,28] Research on microbial contamination also revealed the presence of harmful bacteria in herbal medicines, posing serious health risks to consumers,[29] that can include pregnant women. These issues could endanger the lives of pregnant women and their babies, potentially leading to severe complications or even death for one or both.

The third theme, "Perceived health risks of using traditional herbal medicines during pregnancy," focused on participants' perspectives regarding potential complications and their recommendations on the use of these medicines.

CHWs highlighted that traditional herbal medicines pose significant risks to both the mother and baby. They attributed these risks to the lack of regulation and the absence of rigorous quality checks and approval processes. A key concern was the unknown composition and dosage of these medicines, which makes their use particularly unsafe for pregnant women. Participants mentioned that complications such as miscarriages, congenital anomalies, stillbirths, or even the death of the mother, baby, or both could result from their use. Given these risks, they recommended limiting the use of traditional herbal medicines during pregnancy and emphasized the need for further research to assess their safety and efficacy. These findings align with other studies, which have similarly reported adverse pregnancy outcomes linked to herbal medicine use, including increased maternal morbidity and neonatal morbidity or mortality, and recommended against their general use during pregnancy.[3,4,13,30,31]

Unlike CHWs, traditional healers insist that traditional herbal medicines can be used safely during pregnancy. They claim to have administered or personally used these medicines in multiple pregnancies without observing any adverse outcomes. This contradictory perspective may stem from their reluctance to discredit their profession, which could explain their steadfast assertion of the safety of these medicines.

Furthermore, the absence of rigorous scientific studies assessing the safety and efficacy of traditional herbal medicines, particularly for pregnant women, likely contributes to their confidence in these treatments, because nothing has contradicted their safety. This underscores the urgent need for well-designed interventional studies to evaluate the effects, safety, and potential risks of traditional herbal medicines during pregnancy.[30,32] Such studies would need to follow the key steps of drug development, including laboratory tests and preclinical studies involving animals, and finally, clinical trials involving human subjects.

Study strengths

The strengths of this study lie in its comprehensive inclusion of key community members who provide reliable insights into the use of traditional herbal medicines during pregnancy. Notably, the involvement of CHWs, who are often the first point of contact for pregnant women and play a critical role in assessing and accompanying them to healthcare facilities, ensures valuable perspectives. Additionally, the inclusion of traditional healers, who confidently share their day-to-day experiences and professional practices, adds depth to the findings.

The study also benefits from the inclusion of participants from rural areas, capturing the perspectives of individuals who may have limited literacy or face challenges in accessing healthcare facilities, possibly opting for traditional medicine, though this is not the main reason in Rwanda. Furthermore, the use of in-depth interviews with 30 participants allowed for a comprehensive exploration of their experiences, reaching data saturation and enabling participants to express their views freely on this important topic.

Study limitations

Some challenges and limitations were encountered during the study. A logistical challenge arose due to the delicate nature of the topic, which resulted in delays when scheduling interviews. The need to arrange interviews at participants' convenience, given their availability and the sensitivity of discussing the use of traditional herbal medicines during pregnancy, extended the data collection period. Despite this, the approach allowed for respectful engagement and enriched data.

A limitation during data analysis was the presence of incomplete responses and misspelled words, which could have affected data accuracy. This limitation was mitigated by cross-checking the audio recordings and revising the coding where necessary.

Additionally, a key limitation of the study is its non-interventional design, which prevents the establishment of definitive cause-and-effect relationships between the use of specific traditional herbal medicines during pregnancy and adverse outcomes, such as preterm birth. To address this gap, future longitudinal interventional studies are recommended.

Conclusion

This study, conducted in five districts across two Rwandan provinces, explored the perspectives of CHWs and traditional healers on the use of traditional herbal medicines during pregnancy. Diverging views emerged between the two groups: CHWs advised against their use, citing safety concerns, while traditional healers supported their use, leaving uncertainty about the safety and efficacy of these medicines during pregnancy. In this study, CHWs indicated that these medicines are generally not recommended during pregnancy. In contrast, traditional healers may be reluctant to discredit their profession and, therefore, prefer to advocate for these medicines.

The findings underscore the need for community education campaigns to raise awareness about the potential risks of traditional herbal medicines during pregnancy. Additionally, there is a strong need to conduct interventional studies to scientifically evaluate their safety and efficacy. The relevant authorities should clearly define the package of health services offered by traditional healers, specify the traditional herbal medicines provided, and ensure that traditional medicine is fully institutionalized; allowing traditional healers to offer services that are scientifically approved or legally recognized.

Conflict of interest

None declared.

Credit author statement

OB and MM made substantial contributions to the conception of the study.

OB, MM, DM, and MLIB worked on the study proposal. DM, MLIB collected the data. VB, OB, and MM performed the formal analysis, wrote the original draft of the manuscript, and participated in the final approval of the version to be published. All authors reviewed and edited the final manuscript.

Funding
This research was funded with support from the Swedish International Development Cooperation Agency.

Availability of data and materials
The datasets of analyzed data are available from the corresponding author whenever they are needed by the relevant organ with valid request.

Acknowledgements
The authors sincerely acknowledge the 30 participants who consented to take part in this study. We also gratefully acknowledge the support of the Swedish International Development Cooperation Agency, which funded this study through the University of Rwanda.

References

1. Harakow HI, Hvidman L, Wejse C, et al. Pregnancy complications among refugee women: A systematic review. *Acta Obstet Gynecol Scand.* 2021; 100: 649-657. https://doi.org/10.1111/aogs.14070
2. Sheikh J, Allotey J, Kew T, et al. Vulnerabilities and reparative strategies during pregnancy, childbirth, and the postpartum period: moving from rhetoric to action. *eClinicalMedicine.* 2024; 67: 1-14.https://doi.org/10.1016/j.eclinm.2023.102264
3. Makombe D, Thombozi E, Chilemba W, et al. Herbal medicine use during pregnancy and childbirth: perceptions of women living in Lilongwe rural, Malawi - a qualitative study. *BMC Womens Health.* 2023; 23: 1-12.https://doi.org/10.1186/s12905-023-02387-z
4. Okaiyeto K, Oguntibeju OO. African herbal medicines: Adverse effects and cytotoxic potentials with different therapeutic applications. *Int J Environ Res Public Health.* 2021. https://doi.org/10.3390/ijerph18115988
5. Ezike TC, Okpala US, Onoja UL, et al. Advances in drug delivery systems, challenges and future directions. *Heliyon.* 2023; 9: 1-17. https://doi.org/10.1016/j.heliyon.2023.e17488
6. El Hajj M, Holst L. Herbal Medicine Use During Pregnancy: A Review of the Literature With a Special Focus on Sub-Saharan Africa. *Front Pharmacol.* 2020; 11: 1-13.https://doi.org/10.3389/fphar.2020.00866
7. Al-Tawalbeh D, Hamdan F, Al-Momani E, et al. Investigating Pregnant Women's Attitudes toward Herbal Remedies: A Cross-Sectional Study. *Int J Environ Res Public Health*; 21. *Epub ahead of print.* 2024. https://doi.org/10.3390/ijerph21101290
8. Illamola SM, Amaeze OU, Krepkova L V., et al. Use of herbal medicine by pregnant women: What physicians need to know. *Front Pharmacol.* 2020; 10: 1-16. https://doi.org/10.3389/fphar.2019.01483
9. Aljofan M, Alkhamaiseh S. Prevalence and Factors Influencing Use of Herbal Medicines During Pregnancy in Hail, Saudi Arabia: A cross-sectional study. *Sultan Qaboos Univ Med J.* 2020; 20: 71-76.https://doi.org/10.18295/squmj.2020.20.01.010
10. Muñoz Balbontín Y, Stewart D, Shetty A, et al. Herbal medicinal product use during pregnancy and the postnatal period: A systematic review. *Obstet Gynecol.* 2019; 133: 920-932.https://doi.org/10.1097/AOG.0000000000003217

11. McLay JS, Izzati N, Pallivalapila AR, et al. Pregnancy, prescription medicines and the potential risk of herb-drug interactions: A cross-sectional survey. *BMC Complement Altern Med.* 2017; 17: 1-7.https://doi.org/10.1186/s12906-017-2052-1
12. Adane F, Seyoum G, Alamneh YM, et al. Herbal medicine use and predictors among pregnant women attending antenatal care in Ethiopia: A systematic review and meta-analysis. *BMC Pregnancy Childbirth.* 2020; 20: 1-11.https://doi.org/10.1186/s12884-020-2856-8
13. Zamawe C, King C, Jennings HM, et al. Associations between the use of herbal medicines and adverse pregnancy outcomes in rural Malawi: A secondary analysis of randomised controlled trial data. *BMC Complement Altern Med.* 2018; 18: 1-8. https://doi.org/10.1186/s12906-018-2203-z
14. Tan M, Otake Y, Tamming T, et al. Local experience of using traditional medicine in northern Rwanda: a qualitative study. *BMC Complement Med Ther.* 2021; 21: 1-11.https://doi.org/10.1186/s12906-021-03380-5
15. Alyas AA, Aldewachi H, Aladul MI. Adulteration of Herbal Medicine and its Detection Methods. *Pharmacogn J.* 2024; 16: 248-254. https://doi.org/10.5530/pj.2024.16.36
16. Rwanda Ministry of Health. National Policy of Traditional, Complementary and Alternative Medicine. *Rwanda FDA website.* 2019; 1-19.https://rwandafda.gov.rw/wp-content/uploads/2022/12/Policy%20of%20Tranditional%20Complementary%20Alternative%20Medicine.pdf. Accessed 24 July 2024
17. Olawale SR, Chinagozi OG, Joe ON. Exploratory Research Design in Management Science: A Review of Literature on Conduct and Application. *IJRISS.* 2023; 7: 1384-1395. https://doi.org/10.47772/IJRISS.2023.7515
18. Nyimbili F, Nyimbili L. Types of Purposive Sampling Techniques with Their Examples and Application in Qualitative Research Studies. *Br J Multidiscip Adv Stud.* 2024; 5: 90-99. https://doi.org/10.37745/bjmas.2022.0419
19. Rwanda Governance Board. Rwanda Community Health Workers Programme : 1995-2015. 20 Years of Building Healthier Communities.*RGB.* 2017; 1-60. https://www.rgb.rw/fileadmin/user_upload/RGB/Publications/HOME_GROWN_SOLUTIONS/Rwanda_Community_Healt_Workers_Programme_2017.pdf. Accessed 24 July 2024
20. Birhan W, Giday M, Teklehaymanot T. The contribution of traditional healers' clinics to public health care system in Addis Ababa, Ethiopia: A cross-sectional study. *J Ethnobiol Ethnomed.* 2011; 7: 1-7.https://doi.org/10.1186/1746-4269-7-39
21. Ahmed SK. The pillars of trustworthiness in qualitative research. *J Med Surgery, Public Heal.* 2024; 2: 1-4. https://doi.org/10.1016/j.glmedi.2024.100051
22. Rutledge PB, Hogg JLC. In-Depth Interviews. *Int Encycl Media Psychol.* 2020; 1-6. https://doi.org/10.1002/9781119011071.iemp0019
23. Showkat N, Parveen H. In-depth Interview. *wiley.* 2017. http://dx.doi.org/10.1002/9781119011071.iemp0019
24. Eid AM, Jaradat N. Public Knowledge, Attitude, and Practice on Herbal Remedies Used During Pregnancy and Lactation in West Bank Palestine. *Front Pharmacol.* 2020; 11: 1-10. https://doi.org/10.3389/fphar.2020.00046
25. Tsitsi P, Tabona S, Esther M. Forces behind the Use of Herbs during Pregnancy by Zimbabwean Women: A Case of Gweru District. *J Biosci Med.* 2021; 9: 37-49. https://doi.org/10.4236/jbm.2021.95005
26. Van Wyk AS, Prinsloo G. Health, safety and quality concerns of plant-based traditional medicines and herbal remedies. *South African J Bot; 133. Epub ahead of print.* 2020. https://doi.org/10.1016/j.sajb.2020.06.031
27. Adamolekun MM, Akpor AO, Olorunfemi O, et al. Traditional medicine use during pregnancy and labor in African context: A scoping review. *J Integr Nurs.* 2023; 5: 66-72. https://doi.org/10.4103/jin.jin_56_22

28. Balekundri A, Mannur V. Quality control of the traditional herbs and herbal products: a review. *Futur J Pharm Sci.* 2020; 6: 1-9. https://doi.org/10.1186/s43094-020-00091-5
29. De Sousa Lima CM, Fujishima MAT, de Paula Lima B, et al. Microbial contamination in herbal medicines: a serious health hazard to elderly consumers. *BMC Complement Med Ther.* 2020; 20: 1-9. https://doi.org/10.1186/s12906-019-2723-1
30. Sarecka-Hujar B, Szulc-Musioł B. Herbal Medicines-Are They Effective and Safe during Pregnancy? *Pharmaceutics*. 2022; 14: 1-27. https://doi.org/10.3390/pharmaceutics14010171
31. Ahmed M, Hwang JH, Ali MN, et al. Irrational Use of Selected Herbal Medicines During Pregnancy: A Pharmacoepidemiological Evidence From Yemen. *Front Pharmacol.* 2022; 13: 1-10. https://doi.org/10.3389/fphar.2022.926449
32. Umamaheswari D, Muthuraja R, Kumar M, et al. Standardization of Herbal Drugs - An Overview. *Int J Pharm Sci Rev Res*. 2021; 68: 213-219. https://doi.org/10.47583/ijpsrr.2021.v68i01.033