Original Article

Cultural and Contextual Barriers to Sustained Home Blood Pressure Monitoring Practices Among Indigenous People in Northern Thailand: A Qualitative Study

Tadsaneewan Gantagad[1,2], DNS; Pattarika Panya[3], MNS; Piyaporn Praison[1,2], MNS; Porntip Sareeso[1], MNS; Waraphorn Yaemmisri[1,2], MNS; Phornsawan Chuajedton[1,2], MNS

[1]Department of Nursing, School of Nursing, Mae Fah Luang University, Chiang Rai, Thailand;
[2]Aged care team, Faculty of Nursing, Mae Fah Luang University, Chiang Rai, Thailand;
[3]Department of Nursing, Faculty of Nursing, Chiang Mai Rajabhat University, Mae Hong Son Campus, Thailand

Corresponding Author:
Pattarika Panya, MNS; Department of Nursing, Faculty of Nursing, Chiang Mai Rajabhat University, Mae Hong Son Campus, Postal code: 58000, Thailand
Tel: +66 85 1074739; **Fax:** +66 53 916867; **Email:** Pattarika_pan@g.cmru.ac.th.

Received: 05 March 2025 **Revised:** 24 August 2025 **Accepted:** 30 August 2025

ABSTRACT

Background: Hypertension is a global health concern and a leading cause of unexpected death, especially among vulnerable populations. Although home blood pressure monitoring (HBPM) is effective for self-management and prevention, adherence remains suboptimal, particularly in ethnic minority communities where socio-cultural factors influence behavior. This study explored cultural and contextual barriers to sustained HBPM among the Indigenous Akha population in Chiang Rai, Thailand.

Methods: A descriptive qualitative design was used from February to April 2023. Three focus group discussions were conducted among ten purposively sampled Akha individuals at risk for hypertension in Chiang Rai Province, Thailand. Researchers analyzed the data using inductive thematic analysis based on the six-phase framework outlined by Braun and Clarke, a manual approach conducted without the use of qualitative data analysis software.

Results: Participants included ten Akha individuals aged 47–62 years. Three themes and seven sub-themes were identified as barriers: "cultural beliefs and illness perception" (symptom-based recognition, fear of lifelong medication use, traditional beliefs and community norms); "misalignment between national guidelines and local realities" (competing priorities of work and livelihood demands, lack of flexible, community-centered support); and "system-level obstacles to consistent monitoring" (lack of awareness and informational support, logistical and social barriers to accessing care).

Conclusion: The complex barriers to HBPM among Indigenous populations emphasize the need for tailored health strategies that reflect unique social, cultural, and economic context of each community. Its findings are relevant not only in Thailand but also globally, offering guidance for improving health equity and chronic disease management in underserved groups.

Keywords: Culturally competent care, Home blood pressure monitoring, Hypertension, Indigenous peoples, Rural population

Please cite this article as: Gantagad T, Panya P, Praison P, Sareeso P, Yaemmisri W, Chuajedton W. Cultural and Contextual Barriers to Sustained Home Blood Pressure Monitoring Practices Among Indigenous People in Northern Thailand: A Qualitative Study. IJCBNM. 2025;13(4): doi: 10.30476/ijcbnm.2025.106163.2743.

Introduction

High blood pressure, or hypertension, is a leading risk factor for cardiovascular, cerebrovascular, and renal diseases and remains a significant global public health concern. It is one of the primary causes of premature death worldwide.[1] Currently, an estimated 1.28 billion adults aged 30–79 years globally live with hypertension.[2] With a higher prevalence in low- and middle-income countries (LMICs), at 31.5% (approximately 1.04 billion people), compared to 28.5% (around 349 million) in high-income countries.[1] In Southeast Asia, hypertension rates have increased from 29% to 32%, highlighting the urgent need for improved prevention and management strategies, while other regions, including Europe, have seen a decline.[3]

In Thailand, data from the Sixth National Health Examination Survey (NHES VI, 2019) reported a 25.4% prevalence of hypertension among adults, with 57.0% of men and 40.5% of women remaining undiagnosed.[4] Alarmingly, hypertension control among ethnic minorities has worsened over the past decade.[5] Similar trends are observed in countries like the United States, where racial and ethnic minority groups show suboptimal control rates and limited access to healthcare.[6] In the northern region of Thailand, the highest prevalence of hypertension was exhibited at 33%, followed by the southern region (28%), the central region (23%), Bangkok (23%), and the northeast region (21%).[7] These statistics highlight the urgent need for improved hypertension prevention, particularly among Indigenous groups such as the Akha who face a growing but they remain underserved due to cultural, linguistic, and healthcare access barriers. For international readers, addressing these issues in Thailand can contribute to broader global efforts to promote health equity and reduce the burden of cardiovascular disease in underserved communities.

Home blood pressure monitoring (HBPM) is an effective strategy for screening and self-management of hypertension. It improves patient engagement, treatment adherence, and long-term blood pressure control.[8] However, adherence to HBPM remains low. Although around 50% of individuals with hypertension own a device, only 18% understand the proper guidelines.[9] Studies show that only 51% currently follow recommended HBPM practices, with various behavioral and sociodemographic factors, such as male sex, smoking status, and diabetes history, affecting adherence.[10, 11] In Thailand, a single elevated blood pressure reading of ≥130/80 mmHg without signs and symptoms does not confirm a diagnosis of hypertension under national guidelines. Instead, diagnosis requires confirmation through a standardized 7-day HBPM protocol, with average reading exceeding the diagnostic threshold. This requirement reduces the risk of overdiagnosis by accounting for factors such as white-coat hypertension and situational stress. In rural areas, the Universal Health Coverage (UHC) program has sought to expand HBPM access through two models. The first is training Village Health Volunteers (VHVs) to visit households and conduct blood pressure measurements, and the second is distributing monitoring devices directly among patients for self-measurement.[12]

Previous qualitative research in Thailand has explored the management of hypertension in general. One study found that religious beliefs and spiritual growth influenced older adults' perceptions of life with hypertension.[13] Another study found that adherence to preventive behaviors among Thais with prehypertension involved a complex interplay of exercise, diet control, and stress management.[14] However, these studies do not specifically examine sustained adherence to HBPM, a vital self-management strategy emphasized in global and national guidelines. Moreover, no existing studies have focused on Indigenous populations, whose distinct cultural traditions, health beliefs, and socio-structural barriers may uniquely affect HBPM practices. For international readers, understanding these gaps is crucial, as similar challenges are faced by Indigenous and ethnic

minority communities worldwide. Insights from the Akha population in Thailand can contribute to a broader global understanding of how to design culturally tailored, equity-focused interventions to improve hypertension self-management in underserved populations.

There remains a significant knowledge gap concerning the ethnic minority populations in Thailand, especially Indigenous groups like the Akha. Addressing this gap is crucial to achieving global health equity. Expanding healthcare access alone is an insufficient intervention; effective interventions must also be culturally responsive.[15] Without understanding local beliefs and practices, tools like HBPM risk underutilization, even when available.[16]

Indigenous people experience disproportionate health inequalities, especially in hypertension prevention and management.[17] The Akha, a significant highland tribe in Chiang Rai Province, Thailand, face barriers shaped by their unique cultural, linguistic, and geographic contexts. Traditional health beliefs, limited Thai literacy, and a disconnection from mainstream healthcare systems contribute to poor hypertension management. Research on hill tribes, including the Akha, Lahu, Hmong, Yao, Karen, and Lisu, showed low healthcare utilization, with only 45.5% having a blood pressure screening in the past year, and 70.8% having poor knowledge of hypertension prevention. Older age, low formal education, and limited language skills are significant risk factors.[18] Cultural beliefs also shape treatment-seeking behavior. Many Indigenous individuals prefer traditional medicine and only recognize hypertension when symptoms are present, resulting in delayed diagnosis and poor monitoring.[19] Geographic isolation and limited infrastructure further restrict access to care.[20] Despite growing awareness, the socio-cultural dimensions of HBPM adherence remain underexplored, particularly in Indigenous in Thailand. Therefore, this study aimed to explore cultural and contextual barriers to sustained HBPM among the Indigenous Akha population in Northern Thailand.-

Materials and Methods

This qualitative descriptive study employed inductive thematic analysis and was conducted in Chiang Rai Province, Thailand, a region with a significant Indigenous population, particularly the Akha. Ten Akha participants were purposively recruited by the first and second authors and a local nurse, with support from community health workers and VHVs familiar with the local context. Eligibility criteria included 1) Being Akha aged 45 years and older; 2) Having documented evidence (e.g., health screening reports or community clinic records) of a previously single elevated blood pressure reading (≥130/80 mmHg) within the past 12 months, without a formal physician diagnosis of hypertension. This included individuals whose single readings could meet the hypertension threshold (e.g., 150/90 mmHg); 3) Having experience with HBPM conducted by VHVs, with results that did not meet the diagnostic criteria for hypertension based on Thailand guidelines; and 4) residency in Mae Suai District, Chiang Rai Province, with the ability to provide insights into local healthcare experiences. Exclusion criteria were cognitive impairments and unwillingness to participate.

To minimize bias and enrich data quality, the participants were organized into three focus groups using a purposive matching approach. Participants were grouped to ensure diversity within each group while maintaining comparability across groups in terms of key characteristics, including family history of hypertension, level of education, and previous interactions with the healthcare system. This grouping strategy aimed to ensure a balanced representation of perspectives and experiences, facilitating more nuanced discussion and thematic saturation.

Data were collected from February to April 2023. Although only three focus group discussions (FGDs) were conducted, this extended period was necessary to build trust within the Akha community, accommodate participants' schedules, and ensure culturally

appropriate engagement. Rural logistics, language barriers, and seasonal activities further necessitate a flexible timeline. Each FGD lasted approximately 90 minutes and included 3 to 4 participants. Sessions were held in a community meeting space arranged in a circular seating format to encourage open dialogue. Discussions were conducted in either Thai or Akha, depending on the participants' language preferences, with the assistance of bilingual Akha–Thai VHVs who served as interpreters and note-takers. The lead researcher moderated each session using a semi-structured interview guide that had been developed and piloted beforehand. With informed consent, audio recordings and field notes were collected for analysis. Although the sample size was relatively small, data saturation was achieved, and no new codes or themes emerged during analysis. This aligns with qualitative research standards where small, information-rich samples are appropriate for in-depth thematic exploration.[21]

This study used inductive thematic analysis, following the six-phase framework outlined by Braun and Clarke, a widely recognized method for interpreting qualitative data.[22] Data analysis was conducted manually and simultaneously with data collection to allow emerging insights to inform subsequent interviews. All audio recordings were transcribed verbatim, and the team conducted multiple rounds of immersive reading to identify patterns and recurring concepts. Following Braun and Clarke's six-phase approach, the analysis began with familiarization with the data, followed by the generation of initial codes, which involved labelling significant statements and frequently used expressions. These codes were then collated into potential themes, which were reviewed for coherence, defined and named, and finally reported with supporting evidence. This approach allowed the researchers to identify meaningful thematic categories that reflected participants' challenges and the influence of cultural factors on their engagement with HBPM.

This study ensured rigor in thematic analysis by adhering to the trustworthiness criteria proposed by Lincoln and Guba, which include credibility, dependability, confirmability, and transferability.[23] To ensure the trustworthiness of the findings, the study employed a rigorous and collaborative approach grounded in established qualitative research principles. Credibility, or confidence in the truth of the findings, was enhanced through peer checking and debriefing. The research team actively collaborated to verify the accuracy and relevance of emerging themes. The analytical process began with the second author leading data collection and conducting the initial transcript coding. The first researcher independently cross-checked the coding framework to ensure consistency. Theme development was a guided, collaborative effort, facilitated by regular peer debriefing sessions to strengthen interpretive validity. Further, the dependability and confirmability of the study were systematically addressed. A comprehensive audit trail was maintained, documenting all methodological decisions and coding iterations. To support confirmability, the team engaged in ongoing reflexive discussions, which helped to identify and mitigate potential biases and ensure all findings were firmly grounded in participants' accounts rather than the researchers' preconceptions. Finally, transferability was promoted by providing thick and descriptive details of the research context and participant experiences. The research team held regular meetings to refine coding decisions, compare interpretations, and maintain analytical alignment throughout the study.

Ethical approval for this study was obtained from the Chiang Rai Public Health Office Ethics Committee, Thailand (Approval No. 30/2565). Before participation, all individuals were fully informed about the study objectives and methods, as well as their right to withdraw from participation at any time without penalty. Written informed consent was obtained from each participant.

To ensure confidentiality, we removed all personal identifiers. Audio recordings and written data were stored securely for five years, after which they will be permanently destroyed. Study findings are reported only in aggregated, non-identifiable formats. All procedures adhered to the ethical standards of the institutional review board and followed the principles outlined in the Declaration of Helsinki, ensuring the protection, safety, and dignity of participants throughout the research process.

Results

The study sample comprised ten Akha individuals, aged 47–62 years, with no formal diagnosis of hypertension. Participants were identified as at risk based on primary care hospital health records, which documented a single elevated blood pressure reading (≥130/80 mmHg) within the past 12 months. Their recorded blood pressure values ranged from 130/80 mmHg to 145/92 mmHg, consistent with the Thai Guidelines on the Treatment of Hypertension, as summarized in Table 1. All participants had prior experience with HBPM conducted by VHVs, with results not meeting Thailand diagnostic criteria for hypertension. Although two participants owned personal blood pressure monitors, the VHVs uniformly conducted all measurements. The VHVs used a single, calibrated device from the primary care center and visited each participant's home. This standardized approach was chosen because healthcare personnel were not confident in the accuracy of the participants' devices. In cases where the VHVs did not find the participant at home during a visit, the participant was required to either travel to the nearby primary care center for a measurement or call the VHVs to schedule another home visit.

The group consisted of five women and five men, representing common rural occupations: four were farmers, two were traders, two were laborers, and two were housewives. Their work contexts reflect physical labor and limited flexibility, which may influence their HBPM engagement. The sample provided valuable insights into the cultural and contextual barriers affecting HBPM use in a high-risk, Indigenous population.

Data were analyzed using inductive thematic analysis. A total of 112 initial codes were generated. These were compared and refined through team discussions, resulting in the identification of three main themes and seven sub-themes that are significant themes affecting HBPM adherence, as summarized in Table 2.

1. Cultural Beliefs and Illness Perception

The participants' perceptions of health beliefs and community perceptions played a significant role in shaping their engagement with HBPM adherence.

1.a. Symptoms-based Recognition of Hypertension

Several participants only recognized illness when experiencing noticeable symptoms, leading them to question the

Table 1: Characteristics of the Participants in the Study

Participant ID	Age (years)	Sex	Occupation	Previous blood pressure Level (mmHg)
P1	47	Male	Farmer	135/85
P2	52	Female	Trader	140/90
P3	60	Male	Farmer	130/85
P4	49	Female	Housewife	138/88
P5	55	Male	Farmer	145/92
P6	62	Female	Laborer	135/80
P7	48	Male	Laborer	137/87
P8	53	Female	Trader	139/89
P9	57	Male	Farmer	141/91
P10	61	Female	Housewife	136/86

Table 2: Sub-themes and themes generated from the data

Sub-themes	Themes
Symptom-based recognition of hypertension Fear of lifelong medication use Traditional beliefs and community norms influencing health behavior	Cultural beliefs and illness perception
Competing priorities of work and livelihood demands Lack of flexible community-centered support	Misalignment between national guidelines and local realities
Lack of awareness and informational support Logistical and social barriers to accessing care	System-level obstacles to consistent monitoring

necessity of HBPM if they felt physically well. This perspective contributed to delayed engagement in hypertension screening and irregular monitoring practices. A participant from the second FGD stated:

"I do not believe I have hypertension because I do not feel sick. The nurse said my blood pressure was high, but I work every day and feel fine. I think I don't need to check my blood pressure as she told me." (P3)

1.b. Fear of Lifelong Medication Use

Some participants associated a hypertension diagnosis with a lifelong dependence on medication. This belief discouraged them from checking their blood pressure or seeking medical help. One participant from the first FGD said:

"My friend told me if I had high blood pressure, I would have to take medicine for life. I will not take the medicine. thus, I exercise more instead of checking my blood pressure." (P8)

1.c. Traditional Beliefs and Community Norms Influencing Health Behavior

Social networks and cultural norms shaped attitudes toward hypertension. Community members influenced each other's views, sometimes spreading misconceptions about blood pressure monitoring. These findings highlight the need for culturally tailored health education that aligns with their understanding of hypertension. A participant from the first FGD stated:

"People in my village say high blood pressure is normal when you get older. If you do not feel sick, there is no need to worry." (P7)

2. Misalignment between National Guidelines and Local Realities

Although Thailand's national hypertension prevention guidelines emphasize structured follow-ups and continuous monitoring, local realities and daily life routines often make HBPM adherence difficult. Participants highlighted the gaps between standardized protocols and their real-life experiences.

2.a. Competing Priorities of Work and Livelihood Demands

Participants, particularly those working in agriculture, found it difficult to follow HBPM schedules due to the demands of their work. The rigid schedules of HBPM make it hard to follow because their work is unpredictable. Financial pressures make it even more difficult, as taking time off for check-ups could mean losing income or missing work opportunities. One participant from the third FGD maintained:

"The nurse told me to measure my blood pressure every day for a week, but I cannot. I have to work on the farm. If I miss the scheduled BP measurement at my home with the VHVs, I cannot leave my work to go to the VHVs' house for monitoring. I will lose my money." (P9)

2.b. Lack of Flexible Community-centered Support

While the hypertension care system in Thailand primarily operates through formal

clinics, many participants expressed a need for community-level support systems that align with their daily routines and cultural context. Participants reported that work-related time constraints and limited local outreach hindered their ability to follow national monitoring guidelines. They emphasized the importance of having localized health services such as blood pressure monitoring stations within villages or regular visits from VHVs to support sustainable HBPM engagement. This sub-theme highlights the need for flexible, community-centered strategies that enable the residents to engage in hypertension prevention without relying solely on clinic-based care. One participant from the second FGD stated:

"It would be much easier for both of us if the VHVs had their equipment. That way, they would not need to borrow it from the clinic and could visit me at home every day for education and to check my blood pressure. If I miss the BP measurement due to my work, they could come back any time since they'd always have the device with them." (P2)

3. System-level Obstacles to Consistent Monitoring

Participants reported inconsistencies in access to hypertension care, leading to irregular HBPM practices and missed follow-ups.

3.a. Lack of Awareness and Informational Support

A primary finding was that participants did not adhere to a structured HBPM schedule, often citing a lack of understanding and practical barriers. The prescribed daily monitoring often clashed with participants' demanding work schedules, particularly farming, prompting them to adjust the arrangement. Although they understood the nurse's instructions, some participants appeared less aware of the importance of consistent blood pressure monitoring for early detection and control. One participant from the First FGD explained:

"I did not know why I needed to measure my blood pressure every day. I thought it was enough to check only when I felt unwell." (P7)

Furthermore, this non-adherence was compounded by a lack of clear explanation for the intensive monitoring protocol. Without understanding the rationale, participants perceived the schedule as excessive, which created a significant feeling of "kreng jai," a reluctance to impose on the volunteers. A participant from the first FGD said:

"No one explained to me why I had to measure my blood pressure for seven days. It felt like it was too much. I felt very 'kreng jai' (เกรงใจ) toward the VHVs because it felt like I was bothering them so often." (P7)

3.b. Logistical and Social Barriers to Accessing Care

Participants also faced structural and geographical barriers to accessing healthcare services. They lived in remote areas far from health centers with limited transportation, making regular clinic visits for blood pressure monitoring unlikely, especially if they felt well. To overcome these barriers in the context of rural Thailand, two main models for HBPM have been implemented. The first model involves VHVs visiting homes to measure individuals' blood pressure, a common approach driven by limitations in equipment availability. The second model involves providing patients with their own devices to use at home. These strategies represent practical attempts to mitigate the system-level access challenges embedded in the healthcare infrastructure. Unlike Sub-theme 2.2, which focuses on community service delivery, this sub-theme reflects these broader structural issues. One participant from the third FGD stated: *"It is difficult to coordinate with the VHVs. Sometimes, they visit when I'm not home, and it's not convenient to go to their house because it's not nearby. I also feel bothered asking them to come over to recheck my blood pressure, especially when I don't have any symptoms. I know they are busy, and I don't want to be imposed on them." (P5)*

Discussion

This study highlights how cultural beliefs, daily life challenges, and systemic barriers shape HBPM practices among the Akha population in northern Thailand. Although Thailand national hypertension prevention guidelines promote structured follow-ups and regular HBPM as essential strategies for controlling high blood pressure, their implementation remains inadequate in Indigenous and marginalized communities. This gap is due to a combination of mismatched health beliefs, economic constraints, and limited access to community-based health resources.

A key insight from this study is the symptom-based illness perception among participants. Many Akha individuals believe that hypertension only requires medical attention when noticeable symptoms, such as headaches, dizziness, or physical weakness, are present. This belief, deeply rooted in traditional understandings of illness, discourages the use of preventive health behaviors, particularly HBPM. Without obvious symptoms, people may assume they are healthy, ignoring the "silent" nature of hypertension.[24] This finding is not unique to the Akha community. Similar perceptions have been observed in rural Thai communities, where asymptomatic conditions such as hypertension are frequently underestimated. For instance, a study on Thai-Melayu older adults revealed that personal experiences and cultural beliefs shaped their understanding of hypertension. High blood pressure was often viewed as a common and non-serious condition, with its dangers only acknowledged when obvious symptoms appeared.[25] Additionally, hypertension was believed to result from an imbalance in blood flow, consistent with traditional health concepts rooted in local interpretations of bodily function.[25] Likewise, studies from other LMICs such as Bangladesh and India have documented that rural and low-literacy populations are less aware of asymptomatic diseases, resulting in lower rates of diagnosis, monitoring, and treatment.[26-28] These cultural perceptions highlight the need for targeted education to improve understanding and uptake of HBPM.

Compounding this misconception is a deep-seated fear of medicalization, particularly the need for lifelong medication. Many participants reported avoiding HBPM to sidestep being diagnosed with hypertension, which they believed would commit them to long-term pharmaceutical treatment. This avoidance behavior reflects anxiety over medication side effects, costs, and a perceived loss of personal control. Such concerns were also reported in a study where newly diagnosed patients expressed emotional distress, including worry, confusion, and even depression upon learning of their condition.[29] These fears are particularly pronounced in Indigenous populations, who often prefer traditional healing methods over biomedical interventions.[27] This reluctance can lead to delayed care, non-adherence to treatment plans, and ultimately, poor hypertension control.

Beyond cultural factors, economic and logistical barriers also play a critical role. Many participants, particularly those working in agriculture, expressed frustration that existing health service schedules are incompatible with their work routines. Attending clinic appointments often means lost wages and increased financial burden. This sentiment is echoed in research that identifies financial hardship as a key determinant of delayed care and low treatment adherence.[30, 31] For individuals living in remote areas, these challenges are exacerbated by long travel distances, inadequate transportation infrastructure, and a scarcity of publicly available HBPM devices.[31] These barriers highlight the misalignment between national policy and the lived experiences of rural populations.

Another significant barrier is the lack of continuous support for behavior change. Participants did not follow a regular schedule for HBPM, often skipping or forgetting to measure their blood pressure without

prompts. This reflects a broader issue of low health literacy and poor reinforcement systems. A study highlighted that mobile health (mHealth) interventions, such as self-measured blood pressure (SMBP) programs combined with telephone feedback, were well-received by participants and represent a scalable solution for engaging individuals in hypertension self-management.[32] To improve long-term engagement in SMBP, it is essential to offer enhanced support during the initiation phase, address unmet health-related social needs, and implement strategies that encourage social norms favoring regular monitoring and preventive care.[32] Moreover, uncertainty SMBP could be reduced by providing information specifically about how to interpret SMBP, what variation is acceptable, adjustment for home-clinic difference, and for patients, what they should be concerned about, and how to act.[33]

To bridge these gaps, community-based and culturally tailored interventions are essential. Participants in this study emphasized the importance of VHVs, who not only speak the local Akha language but are also trusted members of the community. VHVs serve as intermediaries between the health system and the people, providing education, reminders, and emotional support. Evidence from hypertension programs among Hill Tribe populations in northern Thailand shows that culturally adapted care improves both awareness and adherence to monitoring and treatment protocols.[34]

Moreover, integrating health promotion into community life, such as setting up monitoring stations at local events, religious gatherings, and village markets, has the potential to reduce stigma and increase participation. Conducting health screenings in their own communities can improve participation rates. For example, the Health Mapping Exercises program in Singapore provided free, door-to-door cardiovascular disease risk screening for residents of one- or two-room public rental flats, making services highly accessible.[35] Similarly, a tuberculosis screening study found that for every additional 12 minutes of walking time between the neighborhood and a health facility, the likelihood of residents using screening units located within their neighborhoods increased by 50%, highlighting the impact of convenient, home-proximate services on uptake.[36]

The findings from this study support a growing body of evidence suggesting that standardized, clinic-based models are insufficient in Indigenous or underserved settings. National guidelines often fail to account for cultural contexts, economic realities, and the everyday responsibilities of rural communities. To be effective, hypertension prevention strategies must be flexible, inclusive, and locally driven. Policies should prioritize task-shifting, empower VHVs and other lay health workers to conduct monitoring, provide education, and offer ongoing support.

This study reinforces the need for culturally grounded, community-based strategies to improve HBPM adherence in Indigenous communities. For international health professionals and policymakers, these findings are relevant in three key ways. Firstly, symptom-oriented health beliefs are common across many rural and Indigenous populations; addressing them requires health education that aligns with local worldviews. Secondly, fear of diagnosis and medication can undermine preventive efforts. Therefore, culturally sensitive counseling and shared decision-making are essential. Thirdly, community-led models, utilizing trusted local actors such as VHVs, provide scalable solutions for low-resource settings. By tailoring hypertension management programs to local cultural, economic, and structural realities, health systems can improve patient engagement and outcomes, not only among the Akha in Thailand but also in comparable global contexts.

This study employed a qualitative approach centered on Focus Group Discussions to gain a deep and interactive understanding of community health perspectives. This method

proved highly effective, yielding rich insights into the shared beliefs and social dynamics that might otherwise be missed. However, the very techniques that provided this depth also created inherent limitations. While essential for building trust and access, recruiting participants through VHVs introduced a risk of selection bias, meaning our sample may not fully represent the entire community. Similarly, the group dynamic of the FGDs, while excellent for observing collective norms, may have discouraged the expression of individual dissenting views. The analysis was also confined to verbal data due to the use of audio recordings. Looking forward, we hope that future research will build on this foundation by addressing these limitations. Incorporating observational methods would capture non-verbal cues; also, assessing variables such as participants' prior health education and digital literacy would provide a more complete picture of the factors influencing health behaviors.

Conclusion

This study offered a nuanced understanding of the complex barriers to HBPM adherence among Indigenous individuals. It underscores the need for health systems and policymakers to move beyond one-size-fits-all approaches and instead develop strategies that are deeply embedded in the social, cultural, and economic fabric of the communities they serve. These insights are not only relevant for Thailand but also for other countries seeking to promote health equity and improve chronic disease outcomes among Indigenous and underserved populations worldwide.

Acknowledgement

We appreciate the support and guidance of the Aged Care Team, Mae Fah Luang University, and the Faculty of Nursing, Chiang Mai Rajabhat University. Special thanks to all participants for sharing their experiences and to the Mae Suai, Chiang Rai Province healthcare team, including village health volunteers and local providers, for their assistance and dedication to community health. Your contributions made this research possible.

Authors' Contribution

TG made substantial contributions to the conception, design, and oversight of the study. PPa and PPr contributed to the study design, coordinated data collection and analysis, and led the drafting and revision of the manuscript. PP, PS, WY, and PC were members of the research team who actively participated in data collection and assisted in data interpretation. They contributed to critical revisions of the manuscript for intellectual content. All authors reviewed and approved the final version of the manuscript for publication and agreed to be accountable for the integrity and accuracy of the work. The corresponding author affirms that all individuals listed meet the authorship criteria and that no qualifying contributors have been omitted.

Funding Source

This research received no specific grant from any funding agency, public or private.

Conflict of Interest

None declared.

Declaration on the Use of AI

I acknowledge using ChatGPT4-o (OpenAI, https://openai.com) for writing assistance, including grammar correction and clarity enhancement. The AI was used exclusively to improve readability and coherence.

References

1 Mills KT, Stefanescu A, He J. The global epidemiology of hypertension. Nature Reviews Nephrology. 2020;16:223-37.
2 World Health Organization. Hypertension. Geneva: World Health Organization; 2023.

3 Kario K, Okura A, Hoshide S, et al. The WHO Global report 2023 on hypertension warning the emerging hypertension burden in globe and its treatment strategy. Hypertension Research. 2024;47:1099-102.
4 Sakboonyarat B, Rangsin R. Characteristics and clinical outcomes of people with hypertension receiving continuous care in Thailand: a cross-sectional study. Lancet Regional Health Southeast Asia. 2023;21:100319.
5 Abrahamowicz AA, Ebinger J, Whelton SP, et al. Racial and ethnic disparities in hypertension: barriers and opportunities to improve blood pressure control. Current Cardiology Reports. 2023;25:17–27.
6 Ogunniyi MO, Commodore-Mensah Y, Ferdinand KC. Race, ethnicity, hypertension, and heart disease: JACC Focus Seminar 1/9. Journal of the American College of Cardiology. 2021;78:2460–70.
7 Rusmevichientong P, Morales C, Castorena G, et al. Dietary salt-related determinants of hypertension in rural northern Thailand. Int J Environ Res Public Health. 2021;18:377.
8 Sharman JE, Howes FS, Head GA, et al. Home blood pressure monitoring: Australian Expert Consensus Statement. Journal of Hypertension. 2015;33:1721–8.
9 Trefond J, Hermet L, Lambert C, et al. Home blood pressure monitoring and adherence in patients with hypertension on primary prevention treatment: a survey of 1,026 patients in general medicine in the Auvergne region. BMC Primary Care. 2022;23:131.
10 Tucker KL, Sheppard JP, Stevens R, et al. Self-monitoring of blood pressure in hypertension: a systematic review and individual patient data meta-analysis. PLoS Medicine. 2017;14:e1002389.
11 Anbarasan T, Rogers A, Rorie DA, et al. Factors influencing home blood pressure monitor ownership in a large clinical trial. Journal of Human Hypertension. 2022;36:325-32.
12 Visanuyothin S, Plianbangchang S, Somrongthong R. An integrated program with home blood-pressure monitoring and village health volunteers for treating poorly controlled hypertension at the primary care level in an urban community of Thailand. Integrated Blood Pressure Control. 2018;11:25–35.
13 Chantakeeree C, Sormunen M, Jullamate P, et al. Perceptions on quality of life among older adults with hypertension in Thailand: a qualitative study. Working with Older People. 2024;28:213–23.
14 Chukumnird S, Boonyasopun U, Jittanoon P. Perspectives regarding adherence to preventive behaviors: a qualitative study of Thais with prehypertension. Pacific Rim International Journal of Nursing Research. 2016;20:106-18.
15 Joo JY, Liu MF. Culturally tailored interventions for ethnic minorities: a scoping review. Nursing Open. 2021;8:2078–90.
16 Khoong E, Commodore-Mensah Y, Lyles C, et al. Use of self-measured blood pressure monitoring to improve hypertension equity. Current Hypertension Reports. 2022;24:599-613.
17 Hazarika CR, Babu BV. Prevalence of hypertension in Indian tribal population: a systematic review and meta-analysis. Journal of Racial Ethnic Health Disparities. 2024;11:451–67.
18 Somprasong K, Apidechkul T, Kullawong N, et al. Prevalence of and factors associated with hypertension among the hill tribe population aged 35 years and over in northern Thailand: a cross-sectional study. American Journal of Cardiovascular Disease. 2020;10:6-16.
19 Kronish IM, Leventhal H, Horowitz CR. Understanding minority patients' beliefs about hypertension to reduce gaps in communication between patients and clinicians. Journal of Clinical Hypertension. 2012;14:38–44.
20 Scott ECS, Hoskin PJ. Health inequalities in cancer care: a literature review of pathways to diagnosis in the

United Kingdom. E Clinical Medicine. 2024;76:102864.
21 Ahmed SK. Sample size for saturation in qualitative research: debates, definitions, and strategies. Journal of Medicine Surgery and Public Health. 2025;5:100171.
22 Braun V, Clarke V. Using thematic analysis in psychology. Qualitative Research in Psychology. 2006;3:77–101.
23 Lincoln YS, Guba EG. Naturalistic inquiry. Newbury Park (CA): Sage Publications; 1985.
24 Peltzer K, Pengpid S. The prevalence and social determinants of hypertension among adults in Indonesia: a cross-sectional population-based national survey. International Journal of Hypertension. 2018;2018:5610725.
25 Udompittayason W, Boonyasopun U, Songwathana P. Perspectives on hypertension among Thai-Melayu elderly in a province of southern Thailand: an ethnographic study. Songklanagarind Journal of Nursing. 2015;35:45–60.
26 Kayima J, Wanyenze RK, Katamba A, et al. Hypertension awareness, treatment, and control in Africa: a systematic review. BMC Cardiovascular Disorders. 2013;13:54.
27 Naheed A, Haldane V, Jafar TH, et al. Patient pathways and perceptions of hypertension treatment, management, and control in rural Bangladesh: a qualitative study. Patient Preference and Adherence. 2018;12:1437–49.
28 Nagarkar A, Gadhave S, Gund P, et al. Comparative study of illness perception among hypertensive patients in India. International Journal of Psychology and Behavioral Sciences. 2013;3:151–6.
29 Shakya R, Shrestha S, Gautam R, et al. Perceived illness and treatment adherence to hypertension among patients attending a tertiary hospital in Kathmandu, Nepal. Patient Preference and Adherence. 2020;14:2287–300.
30 Palmer R, Smith BJ, Kite J, et al. The socio-ecological determinants of help-seeking practices and healthcare access among young men: a systematic review. Health Promotion International. 2024;39:daae024.
31 Rossi MM, Radunovich HL, Parisi MA. Rural veteran perception of healthcare access in South Carolina and Florida: a qualitative study. BMC Health Services Research. 2024;24:826.
32 Hellem AK, Whitfield C, Casetti A, et al. Engagement in self-measured blood pressure monitoring among medically underresourced participants (the Reach Out Trial): digital framework qualitative study. JMIR Cardio. 2023;7:e38900.
33 Fletcher BR, Hinton L, Hartmann-Boyce J, et al. Self-monitoring blood pressure in hypertension, patient and provider perspectives: a systematic review and thematic synthesis. Patient Education and Counseling. 2016;99:210–9.
34 Panya P, Yaemmisri W, Viriyaratanakul B, et al. Development of community participation program on knowledge and health prevention behaviors related to hypertension among hill tribe older adults in northern Thailand. Open Nursing Journal. 2024;18:1-7.
35 Lim KK, Lim C, Kwan YH, et al. Association between access to health-promoting facilities and participation in cardiovascular disease (CVD) risk screening among populations with low socioeconomic status (SES) in Singapore. Primary Health Care Research and Developement. 2019;20:e98.
36 Jenkins HE, Ayuk S, Puma D, et al. Geographic accessibility to health facilities predicts uptake of community-based tuberculosis screening in an urban setting. International Journal of Infectious Diseases. 2022;120:125-31.