

## Facilitators of regular home blood pressure monitoring: Perspectives from older Thai patients with hypertension

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### Abstract

Hypertension management among older patients in Thailand presents ongoing challenges, highlighting the need for effective disease management strategies. Home Blood Pressure Monitoring is recommended for accurate diagnosis and improved treatment adherence but faces limited adoption in Thailand. This study aimed to explore older Thai patients' perspectives on Home Blood Pressure Monitoring facilitators to inform healthcare plans and promote its adoption. Ten participants were selected from the Comprehensive Geriatric Clinic at King Chulalongkorn Memorial Hospital in Bangkok, Thailand. Semi-structured interviews were conducted, and data were analyzed using a codebook thematic analysis method. Three main themes emerged as key facilitators: (1) Increased disease awareness: participants reported that heightened awareness of their hypertension prompted more proactive self-care behaviours; (2) Enhanced health management: personalized blood pressure monitoring was seen as instrumental in improving disease outcomes and fostering healthier lifestyle choices; and (3) strong support from healthcare providers: the guidance and encouragement from healthcare professionals, particularly doctors, played a crucial role in participants' adherence to home blood pressure monitoring practices, significantly influencing their commitment to regular monitoring. The findings highlight the critical importance of healthcare strategies that prioritize patient education and engagement, as well as the essential role of healthcare professionals in managing hypertension effectively through home blood pressure monitoring. Integrating home blood pressure monitoring recommendations into routine clinical care could lead to significantly improved hypertension management outcomes in older adults.

**Keywords:** Facilitator, Home blood pressure monitoring, Hypertension, Older People

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## Introduction

The global prevalence of hypertension has significantly increased, affecting approximately 1.1 billion people as of 2024<sup>1</sup>. Notably, less than half of the diagnosed individuals receive necessary treatment, with only about one-fifth achieving adequate blood pressure (BP) control<sup>2</sup>. Advancing age substantially heightens the risk of hypertension, highlighted by the Framingham Heart Study, which revealed a lifetime risk of over 90% for individuals aged 55-65 and a considerable occurrence by age 70<sup>3</sup>. Numerous studies consistently emphasise the low awareness and suboptimal disease control among older adults<sup>4-7</sup>

In Thailand, the reported prevalence of hypertension in 2023 was 15.38%, noticeably surging among older individuals and affecting 46.13% of this demographic group<sup>8</sup>. Hypertension, recognised as a significant modifiable risk factor, stands as the most diagnosed condition in outpatient settings, substantially contributing to mortality rates due to ischemic heart disease and stroke<sup>8,9</sup>. Moreover, only a quarter of older individuals effectively managed hypertension, with almost half unaware of their diagnosis and receiving no treatment<sup>10</sup>. These findings underline the urgent need for targeted interventions to enhance hypertension care among older Thai population.

Home Blood Pressure Monitoring (HBPM) has emerged as an effective self-measurement method for enhancing disease control and treatment adherence. It is strongly endorsed by various guidelines, including those in Thailand, as a reliable means of assessing BP<sup>11-15</sup>. Policy implications highlight the cost-effectiveness of HBPM, particularly stressing its significance for older individuals due to their susceptibility to white-coat hypertension and increased BP variability<sup>16,17</sup>. While HBPM has been integrated into diagnostic algorithms and disease management guidelines, studies have noted its limited availability, predominantly among well-

educated and financially secure individuals<sup>18</sup>. Addressing this issue requires enhancing access to HBPM across healthcare levels and establishing lending systems.

Therefore, insights into the perspectives of older Thai patients with hypertension regarding HBPM are essential. This demographic represents a significant portion of those with hypertension, and their experiences are pivotal for shaping healthcare services and policies. Existing literature in Thailand has primarily focused on healthcare providers' views, leaving a research gap concerning older patients' perspectives. Bridging this gap can augment HBPM's effectiveness in disease management and guideline adherence, thus aligning insights with existing policies and potentially managing future healthcare costs.

## Methodology

The study employed an exploratory qualitative approach to deeply explore the perspectives of participants regarding the facilitators related to HBPM. It adopted a post-positivist epistemological stance, emphasising systematic and objective data collection while recognising the potential influence of the researcher's assumptions and socio-cultural contexts on the findings. Furthermore, the study embraced critical realism as the ontological position, acknowledging the fundamental role of human knowledge and comprehension in shaping reality<sup>19</sup>. These integrated frameworks aimed to explore the core reasons behind the facilitators of HBPM, considering individual experiences that significantly impact patients' attitudes towards HBPM.

Participants were recruited through a combination of purposive and convenience sampling methods from the Comprehensive Geriatric Clinic at King Chulalongkorn Memorial Hospital in Bangkok, Thailand. Convenience sampling was chosen to ensure ease of access

to participants who were readily available and willing to participate, thereby facilitating timely and efficient data collection. The inclusion criteria were Thai individuals aged 60 and over diagnosed with hypertension who regularly used HBPM independently. Participants with communication difficulties were excluded from the study. The researcher collaborated with a clinic nurse serving as a gatekeeper, aiding in the identification and selection of qualified participants meeting the study's criteria.

The data were gathered through one-to-one semi-structured interviews conducted online and recorded using audio. An interview guide was utilised to delve into crucial topics encompassing patients' characteristics, disease profiles, the current status of HBPM, perceptions regarding facilitators to HBPM, as well as future perspectives and policy recommendations. To refine the questions and ensure data relevance, a pilot interview was conducted with two individuals. In addition, the pilot study facilitated the assessment and resolution of any technical or accessibility issues by ensuring that older participants could conduct interviews via online platforms with ease. The interviews, conducted in the Thai language, took place between June 8 and August 3, 2023, following ethical approval. Verbatim

transcriptions of the audio recordings were generated for subsequent analysis.

The analysis employed a codebook thematic approach to interpret the data by identifying meaningful patterns and themes. The researcher utilised a deductive approach to establish predefined codes and themes based on established concepts and theories. Nevertheless, due to the flexibility of the approach, the researcher also derived new codes or themes using inductive reasoning while doing the analysis<sup>20</sup>.

The study adhered to ethical guidelines stipulated by the institutional ethics committees and obtained approval from two professional institutions: the Committee of Ethics and Research Governance Online at the Institutional Review Board of the Faculty of Medicine, Chulalongkorn University (IRB No. 0272/66) on May 27, 2023, and the University of Southampton (ERGO II 81904) on June 7, 2023. Participants were provided with information regarding the study and were required to sign a consent form before participating in the study.

## Results

The general data containing patient's characteristics was shown in table 1.

**Table 1.** The characteristics of participants.

Participants' pseudonym	Age	Sex	Current occupation	Previous Occupation	Education	Approximate Income/month (Baht)
Bua	67	Female	Retirement	Teacher	Bachelor's degree	50,000
Chai	63	Male	Retirement	Office worker	Master's degree	300,000
Dao	70	Female	Retirement	Government officer	Master's degree	40,000

**Table 1.** The characteristics of participants. (Continued)

Participants' pseudonym	Age	Sex	Current occupation	Previous Occupation	Education	Approximate Income/month (Baht)
Emi	72	Female	Retirement	Public Relations Consultant	Master's degree	50,000
Fai	63	Female	Salesperson	-	Bachelor's degree	50,000
Gan	64	Female	Retirement	Teacher	Bachelor's degree	25,000
Hong	66	Female	Retirement	Teacher	Bachelor's degree	25,000
Janya	76	Female	Retirement	Teacher	Bachelor's degree	30,000
Kaew	65	Female	Retirement	Government officer	Master's degree	35,000
Mali	83	Female	Retirement	Nurse	Bachelor's degree	35,000

Ten participants, with an average age of  $68.90 \pm 6.51$  years, were recruited for the study. The majority of participants were female and retired. Notably, all participants had a high level of education

and reported a median monthly income of 37,500 baht. This income level is considered high according to the standards set by the National Economic and Social Development Council<sup>21</sup>(Table 1).

**Table 2.** Characteristics of hypertension and HBPM.

Participants' pseudonym	Hypertension duration (years)	Use of anti-hypertensive agents	Other underlying diseases	HBPM Duration (Years)	Frequency of HBPM Usage
Bua	3 Months	No	Impaired Fasting Glucose, Glaucoma	3 Months	Everyday
Chai	10	Yes	-	1	1 week/month
Dao	20	Yes	Dyslipidemia	2	Everyday
Emi	30	Yes	Dyslipidemia	5	2 weeks before appointment

**Table 2.** Characteristics of hypertension and HBPM. (Continued)

Participants' pseudonym	Hypertension duration (years)	Use of anti-hypertensive agents	Other underlying diseases	HBPM Duration (Years)	Frequency of HBPM Usage
Fai	4	Yes	Impaired Fasting Glucose, Dyslipidemia	3	Everyday
Gan	2	No	-	2	Everyday
Hong	4	Yes	Dyslipidemia, Hepatitis	4	1 day/week
Janya	10	Yes	Dyslipidemia, Thyroid disease	5	1 week/month
Kaew	1	No	-	1	10 days/month
Mali	30	Yes	Dyslipidemia	20	1 week before appointment

The duration of hypertension ranged from 3 months to 30 years among the participants. Eight out of ten patients were using antihypertensive medications, and dyslipidemia was the most prevalent concurrent condition. Regarding HBPM usage, it varied from 3 months to 20 years, and the frequency of monitoring depended on factors such as patient satisfaction, doctor's instructions, and disease control (Table 2).

#### **Perspectives on facilitators of home blood pressure monitoring**

Participants identified potential facilitators that supported their engagement in HBPM, categorised into three main themes.

#### **Empowered by disease awareness: from concern to proactive care**

All participants exhibited a strong understanding of hypertension and its associated complications, which significantly influenced their inclination to embrace HBPM practices. This foundational awareness and knowledge, particularly concerns about potential complications like cerebral hemorrhage which were told by five participants,

acted as a driving force behind their commitment to self-care. This was also under the desire to maintain autonomy and avoid burdening their families, which were mentioned by five participants. Moreover, two participants mentioned increased awareness after experiencing illness, prompting individuals to start their self-care journey.

#### ***Awareness of disease and its complications:***

"I have learned a lot about how high blood pressure increases. For a long time already. The possibility that it could cause (cerebral) blood vessels to burst, I, older people with families, are afraid of." - Chai

"After I had high blood pressure, I started to read about it. They said that it's like a silent threat. It doesn't cause any noticeable problems in the early stages. But if it continues, it could affect the kidneys, the heart, or even the brain, something like that." - Keaw

#### ***Burden avoidance:***

"It would ensure that we are not a burden to others, our children, or those close to us. It should come from that perspective, encouraging older

people to take an interest in taking care of their health.” - Fai

“My motivation came from getting sick... I had to spend a whole month in the hospital. Seeing how much my kids and grandkids had to do to care for me during that time made me realise I was burdening them.” - Hong

***Experience and reflection:***

“But before, maybe I didn’t have much discipline... I started to pay more attention. And, due to my age, I worried that the consequences might exceed my control.” - Fai

“My motivation came from getting sick... Seeing how much my kids and grandkids had to do to care for me... made me realise I was burdening them. So, I decided to find ways to stay healthier.” - Hong

**Enhancing health management through home blood pressure monitoring**

All participants acknowledged the benefits of HBPM in enhancing personalised self-management strategies. Eight participants emphasised the importance of monitoring BP to improve disease management outcomes, leading them to incorporate HBPM into their daily routines. Moreover, six participants mentioned that HBPM encouraged positive lifestyle changes, such as dietary adjustments and increased physical activity. Nine participants highlighted that HBPM not only facilitated BP monitoring but also helped them identify potential triggers or underlying causes of abnormal readings, enabling proactive management. They expressed optimism about the possibility of doctors adjusting medications based on consistently normal home BP readings or even reducing the frequency of doctor visits. Furthermore, four participants stressed the significance of monitoring their BP between appointments for health maintenance. This practice revealed hidden benefits by reducing anxiety since they could check their BP readings at home.

***Improving disease outcome:***

“I can control blood pressure better after using home monitoring” (Bua)

“...I take blood pressure medication in the morning and evening. After monitoring our blood pressure regularly for a while... I observe what can I control? My blood pressure has improved. The doctor has reduced the medication from morning and evening to only evening.” - Hong

***Adoption of healthier lifestyles:***

“It helps me control my diet and encourages me to exercise... like, I have to eat less of certain things, and I observe that it helps lower the blood pressure.” - Bua

“I take care of myself, I know my blood pressure levels. Then, I should know what I should do, like about eating, not eating salty foods, and not staying up late. If I stay up late one night, I can notice that my blood pressure goes up to 130-140.” - Fai

***Identifying causes of abnormal BP readings:***

“I’ve noticed why it’s high today and why it’s low today. Normally, I can guess that it’s due to insufficient sleep or consumption of salty or high-sodium foods.” - Emi

“For example, last night, I might have been stressed... If my blood pressure rises, that’s it. I have hypertension...” - Mali

***Reduced doctor visits:***

“Technology makes people start taking care of themselves again. It makes them healthier, not having to go to the hospital frequently.” - Gan

“If I measure our blood pressure and it’s normal, I don’t have to go see the doctor frequently.... I didn’t have to waste time going to see the doctor, waiting for a long time, right?” – Dao

***Reduce anxiety:***

“Well, it’s beneficial in that it prevents me from getting anxious, you know? When I see the numbers, right? And it’s still okay, isn’t it? Like, if I measure blood pressure at home and it’s really

high, then I have to do something about it quickly. Maybe consult the doctor to see what's going on, right? - Janya

#### **Support from medical professionals and healthcare providers**

Medical professionals, particularly doctors, played a crucial role in facilitating the adoption of HBPM practices among participants. Their recommendations were highly valued and often served as a decisive factor in embracing HBPM. Nine participants felt a sense of obligation to follow their doctor's advice. Furthermore, one of them even proceeded with the doctor's instructions without a comprehensive understanding of the advantages of HBPM.

Additionally, five participants highlighted that doctors' interest in their results, along with providing explanations and interpretations of the readings, reinforced their commitment to the practice and enhanced their understanding. Comprehensive instructions and training further empowered participants, giving them the confidence to navigate HBPM effectively. Eight participants emphasised the significance of guidance from healthcare professionals in ensuring precise monitoring techniques, enabling them to handle HBPM intricacies.

#### ***Support by doctors:***

"The doctor's advice is 100% influential. It feels like an assigned task. However, I'm not entirely clear on why I should regularly measure our blood pressure, other than to demonstrate whether it's high or not to the doctor." - Kaew

"The doctor and the nurse instructed me to measure my blood pressure once a month, for seven consecutive days each time. Since the doctor ordered it, I have to comply. But it's good, I think. It helps me check how my blood pressure is during different periods. So, when the doctor told me to measure it, I did." - Chai

"When I visited the doctor, the doctor told me that my blood pressure was still high, and I should continue measuring it regularly. He said that if my blood pressure becomes normal, then I could measure it once a month or something like that."

- Bua

"Sometimes the doctor isn't very interested. They just ask what the reading is...The doctor's interest is a crucial motivation for people to diligently monitor their blood pressure." - Dao

#### ***Support by other healthcare providers:***

"As the nurse informed me, they actually provided a leaflet explaining the method...then I measure my blood pressure for seven consecutive days." - Chai

"The nurse asked how I was doing and explained that I needed to do this and that. I understood, and she taught me that blood pressure is very sensitive. Our emotions or any fluctuations can affect it. I'm trying to understand that." - Dao

#### ***Availability of clear instructions:***

"Actually, giving knowledge is the most important thing. Right from the beginning, it's like starting from scratch. I need to know how to use the device. At first, I didn't know how to use it. I didn't know how to use the device or understand the numbers even if I read them." - Dao

"I got a form from the clinic... I just measure my blood pressure some days. I didn't realise I should measure both in the morning and evening regularly. From now on, I'll measure it both times. I'm curious to compare the results." - Hong

#### **Discussion**

The study's findings unveiled a substantial correlation between disease awareness and individuals' tendency towards self-care, especially regarding potential complications that could lead to dependence. This heightened awareness appeared to be associated with a greater inclination to

embrace HBPM practices, aligning with prior research, which suggests that well-informed individuals about hypertension are more receptive to HBPM adoption<sup>22</sup>. Furthermore, individuals facing health challenges or difficulties managing BP exhibited an increased level of self-awareness, leading to a deeper commitment to maintaining discipline and adopting self-care practices. This observation echoes the principles of the Health Belief Model, suggesting that individuals who comprehend health risks and acknowledge the benefits of proactive measures tend to adopt self-care behaviours<sup>23</sup>. Moreover, participants' heightened awareness seemed to be influenced by family interactions. The individuals voiced apprehensions over their dependence on their children and the possibility of becoming a burden, reflecting the deeply rooted cultural expectation of filial duty in Thai society<sup>24</sup>. This cultural expectation prompts older individuals to prioritise independence, avoiding undue challenges for their families.

The advantages of HBPM serve as a crucial facilitator, empowering patients to actively engage with their condition. This involvement includes identifying potential triggers for abnormal BP, gaining reassurance through monitoring BP during symptomatic and asymptomatic periods, and adopting lifestyle modifications including dietary adjustments and exercise to regulate BP and overall health. Additionally, it reduces the frequency of medical consultations and allows for gradual medication adjustments as the BP stabilises. These multifaceted benefits underscore participants' recognition of HBPM as a valuable tool in managing their health, consistent with existing literature across diverse populations and settings<sup>22,25-29</sup>. Consequently, these various implications of HBPM in treatment serve to alleviate worry or anxiety, enabling patients to monitor their BP as needed.

Significantly, the study discovered that patients placed a high level of trust in their doctors' instructions, leading them to rigorously follow the directives even when they did not completely understand the possible benefits of HBPM. This highlights the remarkable impact that medical practitioners have on changing patient behaviour, regardless of whether patients fully comprehend the rationale behind the advised activities. The findings coincide with previous research in various contexts<sup>25,30</sup>, including the study in Thailand that underscored the dedication of older Thai adults with hypertension to effectively managing their BP under medical supervision<sup>31</sup>. This highlights the role of physicians in introducing and disseminating knowledge about HBPM, significantly contributing to its successful integration. In addition, the provision of practical instructions and training, typically overseen by healthcare professionals, emerged as another noteworthy facilitator, consistent with the aforementioned results<sup>22,32,33</sup>, which motivate patients to carry out HBPM with assurance.

The findings suggest several implications for clinical practice. Increasing self-awareness is crucial to motivate patients to effectively manage their health conditions. Healthcare strategies should prioritise disseminating knowledge and enhancing health literacy to strengthen disease awareness. Consequently, promoting patient engagement and adherence to HBPM practices could be beneficial in improving hypertension management. Additionally, the influence of healthcare professionals, particularly doctors, is significant, given patients' trust in their guidance. Therefore, integrating HBPM recommendations into routine medical care or documentation is crucial to encourage better disease control.

The study's strength lies in its focus on older Thai patients using HBPM for hypertension management, employing qualitative methods that



enhance a comprehensive understanding. Conducted in Thai, the study leveraged shared cultural backgrounds for a nuanced interpretation of participants' perspectives, enabling a thorough investigation with impactful findings for hypertension care practices.

However, inherent limitations need acknowledgment. The small number of participants could impact data saturation and limit the robustness of the findings. Additionally, the study did not employ triangulation techniques, and the use of codebook thematic analysis may have limitations. Dependence on initial codes might not fully capture the complexity and nuance of the data collected later, potentially limiting the depth of the analysis. Participant recruitment was limited to urban clinic settings, and all participants had high income and education levels, potentially restricting the generalisability of the findings to a broader or more diverse population of older Thais with hypertension. The sampling method might have introduced selection bias, favoring those more inclined towards HBPM, possessing greater disease knowledge, and exhibiting proactive self-care behaviors.

To enhance future research, broaden participant diversity across various contexts, including rural areas in Thailand, encompassing diverse socioeconomic and educational backgrounds. Longitudinal studies offer insights into long-term HBPM usage among older adults. Investigating the obstacles faced by those discontinuing HBPM provides deeper insights. Exploring older individuals' perspectives on telemedicine based HBPM is recommended. Implementing these suggestions improves understanding and allows focused approaches for better disease control in older adults with hypertension.

### Conclusion

Gaining insight into the viewpoints of older Thai patients regarding the adoption of HBPM

is essential for developing efficient healthcare strategies. Primary drivers for the adoption of HBPM are concerns regarding hypertension and its associated complications, the intention to alleviate the responsibility on family members, and the recognition of HBPM's contribution to enhancing self-care and disease management outcomes. Moreover, the impact of doctors and healthcare professionals, through their assistance and teaching, was crucial in cultivating participants' dedication to consistent BP monitoring. The study highlights the need of incorporating HBPM recommendations into regular medical care and patient education to effectively improve hypertension control.

### Declaration

The authors declare that no personal relationships or financial conflicts that could have influenced the research presented in this article are known to them.

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