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RESEARCH ARTICLE OPEN ACCESS

Development of Community Participation Program on Knowledge and Health Prevention Behaviors Related to Hypertension among Hill Tribe Older Adults in Northern Thailand

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Abstract:

Background: The Akha hill tribe of older adults in Thailand, a culturally diverse minority, faces health disparities. Due to limited access to health information and services, those who are unable to read Thai are at a higher risk of developing hypertension. Consequently, hill tribe communities need community engagement to enhance healthcare access and communication between health workers and the community.

Objective: This study aimed to investigate the effect of a community participation program on hypertension knowledge and health prevention behaviors among Akha older adults in Thailand.

Materials and Methods: This program was developed based on evidence and insights from community scholars and stakeholders. The program included three activities: 1) training the volunteers, 2) home visits by trained adolescent and adult volunteers, and 3) providing hypertension knowledge through village broadcasts. Pre- and post-intervention surveys were conducted using an Akha-specific hypertension knowledge and prevention behaviors questionnaire.

Results: Among the thirty healthy Akha older adults who could not communicate in Thai, following the implementation of the community participation program, there was a significant increase in hypertension knowledge (P = 0.000) and HT prevention behaviors (P = 0.017).

Conclusion: The community participation program could improve hypertension knowledge and hypertension prevention behaviors of older adults in the Akha hill tribe by bridging the gap between the healthcare system and the community.

Keywords: Community participation, Hypertension, Hypertension prevention, Hill tribe people, Older adults, Akha people.

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1. INTRODUCTION

Since 2005, Thailand has been transitioning towards an aging society. The percentage of older adults is expected to rise to 28% shortly, ultimately leading Thailand to become a super-aged society within the next decade [1]. Multiple chronic diseases in older adults, particularly Hypertension (HT), are common. HT is a highly prevalent condition that dramatically increases in incidence with age, rising by approximately 60% when the age is over 60 [2] and influencing the development of cardiovascular diseases, such as heart failure, myocardial infarction, and stroke, leading to death [3]. Several factors cause HT in older adults, including 1) improper health behaviors, such as eating high-salt and high-fat meals, insufficient physical activity, and experiencing mental stress, and 2) atherosclerosis, which causes a physiological alteration in vessel structure [4, 5].

Hill tribes in Thailand are ethnic minority groups that migrated to Northern Thailand from China, Myanmar, and Laos [6]. These hill tribes include the Lisu, Mien, Palaung, Karen, Hmong, Lahu, and Akha, with the Akha being the most populous, with around 800,000 people in 2012 [7]. The Akha culture and language are distinct from other hill tribes, and the majority of Akha older adults are illiterate, with 74% having difficulty communicating in Thai [8]. This language diversity challenges healthcare communication, negatively impacting patient satisfaction, access to appropriate healthcare, healthcare quality, and patient safety. Although the Thai government is working to improve the Akha people's quality of life and healthcare practices, their remote mountainous location, the distance to hospitals, and predominantly low socioeconomic status remain obstacles [9]. Interestingly, younger Akha people tend to have better Thai language skills than older adults, suggesting that bridging the communication gap between the older and younger generations could be a solution [8]. This could help Akha older adults access the Thai public health system, potentially reducing health disparities and promoting equality in healthcare services, ultimately enhancing the overall quality of life in terms of health for the Akha population [10].

In 2022, approximately 24.7% of the Thai population, or about 23 million people, were reported to have HT. Among the hill tribes in northern Thailand, the prevalence of HT was slightly lower at 24.3% [11]. Notably, less than half of the Akha population in north Thailand had received HT screenings the previous year. Furthermore, a significant portion of the Akha population had high levels of LDL cholesterol (69.6%), high total cholesterol (43.8%), and high cholesterol triglycerides (40.7%) [11]. Previous studies have identified numerous barriers that hill tribes in Thailand face when accessing healthcare services. These barriers include language differences, limited access rights, distance from healthcare centers, transportation difficulties, and stigma from healthcare providers [9]. Notably, one significant factor among the Akha population associated with HT has been found to be their inability to read Thai [11]. Overall, the Akha hill tribe population has been found to be at a heightened risk of developing HT due to several factors, contributing to their vulnerability to health disparities.

Community Participation (CP) is a crucial process that involves community members in addressing their problems. It plays a significant role in creating healthy community environments through changes in public policies and establishing community-wide institutions and services [12]. In the context of health, CP entails community members participating in various health-related activities, allowing them to input and control decisions about healthcare. The level of participation can vary depending on the specific community needs [13]. Especially in health promotion, CP aims to empower individuals to respond to their health and well-being [14]. The findings demonstrate that CP has positive impacts related to Non-Communicable Diseases (NCDs). It increases awareness of NCD risks through health education [15], encourages NCD screenings [16], helps maintain regular blood pressure control, and reduces the risk of cardiovascular diseases [17]. This is achieved by improving individual and community knowledge and enhancing health-seeking behaviors. In Thailand, the integration of primary healthcare with CP began in 1985, involving the training of Village Health Volunteers (VHVs). CP has been widely utilized in Thailand's healthcare system to encourage communities to take responsibility for their health [18]. Lay health workers, including VHVs, have played a critical role in HT management programs, increasing attendance and adherence to treatment regimens [19], effectively reducing blood pressure and body mass index [20], and also improving healthcare services, such as health education, chronic disease management, leadership skills, and patient-provider relationships [21]. Furthermore, non health workers who receive proper training from healthcare professionals serve as vital connectors between the community and formal healthcare services, bridging gaps in the health-care system. This long-term approach has improved community HT health outcomes [22]. Bridging the gap between healthcare professionals and communities in HT prevention presents significant challenges, particularly in the context of hill tribe populations. It requires the establishment of community participation and improved communication processes. The existing literature suggests that the CP program positively influences non-communicable diseases.

However, there is still a lack of clear CP development, specifically for hill tribe populations, for HT prevention. This study aimed to address this gap by utilizing the active participation of hill tribe individuals and healthcare workers to enhance the connection between the health-care system and the community.

2. MATERIALS AND METHODS

The effectiveness of the CP program was tested using a non-controlled pre-test post-test design. The research process conformed to the ethical principles provided in the 2013 version of the Helsinki Declaration for human research.

2.1. Participants

The target population comprised 250 male and female Akha older adults living in the Padad subdistrict, Chiang Rai province, Thailand. The nurse practitioners recruited the participants at the subdistrict health promotion hospital. The inclusion criteria were being unable to communicate in Thai and willing to participate in this program. The following were the exclusion criteria: 1) failing to complete the program, 2) suffering from HT illness, and 3) using vasodilator medicines. The sample size was determined using the G*Power software. The effect size was set at 0.5, the significance level at p 0.05, and the power of this study was 80% [23]. The estimated sample size was 27, and the dropout rate was expected to be 10% [24]. Finally, the sample size was 30.

2.2. Development of a Community Participation Program

The program was developed by a research team based on evidence, the experience of nurse practitioners in working with Akha older adults in the community, and the knowledge of community scholars about the Akha culture. The team proposed a program outline for discussion and development with diverse stakeholders. The program was designed in several stages as follows [13]:

2.2.1. HT and Akha Community Analysis

The research team and community collaborators identified and defined the problems related to HT in the Akha community. This involved reviewing existing literature and conducting focus group discussions with stakeholders, including local nurse practitioners, public health technical officers, village leaders, VHVs, Akha older adults, and Akha youth. They discussed HT control and prevention, the requirements for HT preventative assistance, and personal experiences with HT prevention and control.

2.2.2. Design of the Program

After synthesizing the gathered data, the study team created the initial program draft. This draft underwent review and feedback from three experts, including a family medicine practitioner, a nurse instructor, and a nurse practitioner. After revisions, the final draft was presented to the experts again for further input. These experts suggested culturally appropriate and contextually relevant practices, such as incorporating Akha herbs and considering Akha's health beliefs. The community participation program consisted of three main activities, which are presented as follows:

2.2.2.1. The Akha Volunteer Training

This program involved training five Akha VHVs and ten Akha Younger Volunteers (AYVs) over two days. The training covered HT education (including disease, diet, and exercise for prevention), practical skills, such as blood pressure measurement and first aid for HT emergencies, and the use of home visit books. Participants were evaluated through questionnaires and practical assessments, ensuring their proficiency.

2.2.2.2. The Akha's Health Podcast

This podcast covered five themes related to HT, including basic knowledge, dietary and exercise recommendations, Akha herbs for blood pressure control, Akha culture's impact on blood pressure, and emotional management for reducing blood pressure. Experts reviewed and critiqued the podcast, including an Akha translator, a family medicine practitioner, a nursing teacher, and an Akha scholar.

2.2.2.3. Home Visit Activities

VHVs and AYVs conducted home visits to provide health education and promote healthy behaviors for HT prevention among participants. These visits also offered emotional support, counseling, encouragement, and regular follow-up assessments of intervention effective- ness, including blood pressure monitoring. The adjustments were made as needed.

2.3. Implementation of the Community Participation Program

The program lasted 12 weeks with the following activities:

2.3.1. Week 1

Akha VHVs and AYVs were trained by the research team and initially made home visits to establish a connection with participants, as well as conducted a pretest assessment of demographic data and an understanding of HT prevention, HT preventive behaviors, and baseline blood pressure.

2.3.2. Weeks 2, 4, 6, 8, and 10

The participants listened to Akha's health podcast every Sunday morning and evening to promote their health behaviors.

2.3.3. Weeks 3, 5, 7, 9, and 11

VHVs and AYVs visited homes to provide health education and support. The participants listened to Akha's health podcast to promote healthy behaviors.

2.3.4. Week 12

Post-test assessments and program evaluation were performed through questionnaires, focus group discussions, and open-ended questions, in order to gather feedback on the program's strengths and weaknesses, as well as its practicality and effectiveness. The focus group interviews were conducted in a village hall, lasting 45 minutes. Open-ended questions included the following: "What do you appreciate about VHVs and AYVs, and why?" "What was your favorite aspect of the community participation program, and why?" and "What was your least favorite aspect of the community participation program, and why?"

In summary, this community participation program was carefully designed and implemented to address HT prevention in the Akha community. It involved various stakeholders and incorporated culturally relevant

practices and education. The program's effectiveness and participants' perspectives were assessed at multiple stages.

2.4. Community Participation Program Testing

The program was tested using specific questionnaires and blood pressure monitoring. The research team carefully developed these instruments, and they underwent validation by experts. The three measuring instruments used in the study were as follows:

2.4.1. Demographic Questionnaire

This questionnaire collected information regarding the gender, age, body mass index, and health, such as the underlying disease, drug use, drinking and smoking behaviors, sleep and rest patterns, *etc*.

2.4.2. Hypertension Prevention Knowledge Questionnaire

This questionnaire assessed participants' knowledge of HT prevention, considering Akha culture and lifestyle factors. It consisted of 20 items rated on a three-point Likert scale (ranging from 0 to 2). The items covered basic HT knowledge, health prevention behaviors, and aspects of HT prevention connected to Akha culture. The total score could range from 0 to 40 points, with higher scores indicating better knowledge. This instrument demonstrated good internal consistency and reliability, with a Cronbach's α coefficient of .837.

2.4.3. Hypertension Prevention Behaviors Questionnaire

This questionnaire evaluated participants' behaviors related to HT prevention, considering Akha's culture and lifestyle. It comprised 25 items rated on a four-point Likert scale (ranging from 1 to 4). The questions addressed various aspects, including dietary habits, exercise routines, engagement in Akha activities, and food and herbs related to HT. The total score could range from 0 to 100 points, with higher scores indicating better HT prevention behaviors. This instrument exhibited good internal consistency and reliability, with a Cronbach's α coefficient of .841.

3. RESULTS

A paired t-test was used to compare the change in the level of knowledge and HT prevention behaviors between the pre-test and post-test using IBM® SPSS statistics version 22.

3.1. Characteristics of the Participants

The study involved participants who were illiterate and unable to communicate in Thai, with 57% being women and 43% being men. Their ages ranged from 60 to 71 years, with an average age of 63.35. Most participants were married (60%) and unemployed (96%). A minority of participants were smokers (10%) and consumed alcohol (20%). Additionally, all participants regularly used fish sauce, soybean sauce, and monosodium glutamate in their cooking. On average, the participants weighed 54.01 kg and had a baseline systolic Blood Pressure (BP) of 134 mmHg and diastolic blood pressure of 81 mmHg.

3.2. Before and After Intervention: Differences in HT Knowledge and Health Prevention Behaviors

Before participating in the program, the participants had relatively low knowledge about HT, with an average score of 10.63 (±3.557). Their understanding of Akha herbs related to HT was low. Their health prevention behaviors related to HT were at a borderline low-moderate level, with an average score of 66.47 (±3.794). Exercise behaviors scored the lowest. After participating in the program, there was a significant improvement in HT knowledge, shifting from low to high levels, with an average score of 24.24 (±5.546). A basic understanding of HT showed the most significant improvement. Health prevention behaviors related to HT remained moderate but demonstrated improvement, with an average score of 70.17 (±5.960). Common improved health prevention behaviors included abstaining from drinking and smoking, engaging in daily exercise for at least 30 minutes, and walking or cycling instead of driving for short distances. On the other hand, common poor health behaviors related to HT included using salt rich fish sauces and condiments and consuming high-fat foods and sweet fruits. The feedback from focus group discussions at the end of the intervention indicated that all participants highly appreciated the efforts of the Akha VHVs and AYVs involved in the program; the responses are listed as follows:

“Thanks to the team, Akha VHVs, and AYVs for giving health information that is very easy to understand and caring for our health.”

“We need more Akha language podcasts related to other chronic diseases.”

“Thanks to Akha VHVs and AYVs for routine blood pressure monitoring and giving information for maintaining good blood pressure.”

“Thanks to the team for suggesting Akha’s herb to control blood pressure because we were unaware of it before.”

However, after analyzing the difference between HT knowledge and HT prevention behaviors before and after the intervention using a paired t-test, a significant difference at $p < .05$ was observed, as shown in Table **1**.

Table 1. Comparison of HT knowledge and HT prevention behaviors score before and after the program.

Items	Pre-test	Post-test	Paired t-test	p-value
HT knowledge	10.63, ±3.557	24.24, ±5.546	10.853	*.000**
HT health prevention behaviors	66.47, ±3.794	70.17, ±5.960	2.522	*.017**

Note: n = 30. *$p<0.05$.

4. DISCUSSION

The CP program has been widely utilized in rural healthcare settings in Thailand due to the positive feedback from individuals who have appreciated being cared for and monitored by volunteers. These volunteers have established trust and reliability within the community and contributed to the program's success [25]. Thailand's VHVs have received international recognition as a model for community-based healthcare, which is crucial in managing chronic diseases, especially among older adults [21]. In Thailand, family members traditionally assume primary caregiving responsibilities, particularly spouses and adolescents [26]. In this specific program, both adults and adolescents were actively involved as volunteers. They received training to acquire the necessary skills and knowledge to care for older adults at risk of HT. The program recognized the importance of social and cultural conditions that support health for effective health promotion [20]. Additionally, it incorporated unique aspects of Akha culture and traditions, which were familiar to the participants, thereby increasing their engagement and concern for their health.

Akha VHVs and Akha Young Volunteers (AYVs) effectively communicated information about HT and disease prevention within the context of Akha culture and traditions. They utilized the Akha language and followed a handbook and Akha podcasting education about HT. The CP program specifically focused on providing emotional support, encouraging self-assessment of health behaviors, and offering material support and equipment for group exercises.

The results demonstrated a significant increase in knowledge after the intervention because the program was thoughtfully designed to align with the local culture and was implemented using the Akha language. This approach facilitated easy comprehension for all participants [23, 25, 27]. Previous research has shown a strong correlation between the level of health knowledge and health behaviors [5, 23]. Precise health knowledge increases confidence in the individuals' capacity to enhance or modify health-related behaviors [5]. In conclusion, participants with a high level of health knowledge tended to experience improved health behaviors [19, 20, 22, 28, 29].

CONCLUSION

The primary goal of the CP program was to bridge the gap in HT prevention between healthcare providers and the community. This was achieved by involving all stakeholders in the community to increase awareness and promote individual accountability for their health. Additionally, the CP program was specifically tailored to align with the cultural and traditional contexts of the Akha community. As a result, there was a significant improvement in HT knowledge and enhanced HT behavior prevention in 12 weeks. Moving forward, it is essential to explore technology integration and address a broader range of chronic diseases more extensively through further research.

LIMITATION

Short Program Duration

The program was conducted over just three months, which may limit the sustainability of the results. The short timeframe might not capture long-term effects or changes in behavior. Future studies should consider extending the duration of the intervention to assess its longer-term impact and sustainability.

Lack of Intermediate Measurements

Although pre and post-program evaluations were conducted, there was no systematic monitoring during the intervention period, except for home visits. The lack of intermediate assessments may limit understanding of how changes developed over time. Future research could benefit from more frequent measurements throughout the program to track progress and adapt the intervention as needed.

AUTHORS' CONTRIBUTION

P.S.: Study conception and design; N.G., B.V., W.Y.: Data collection; P.P., T.G.: Analysis and interpretation of results; P.P.: Drafting of the manuscript.

LIST OF ABBREVIATIONS

AYVs	=	Akha young volunteers
CP	=	Community participation
CPP	=	Community participation program
HT	=	Hypertension
NCDs	=	Non-communicable diseases
VHVs	=	Village health volunteers

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The Human Ethics Research Committee of the Chiang Rai Public Health Office, Thailand, granted ethical approval for this study under approval number (CRPPHO 36/2565).

HUMAN AND ANIMAL RIGHTS

All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee, and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Before giving their consent, all participants were informed about the study's objectives, potential risks, assurance of confidentiality, and possible benefits. Importantly, participants had the right to decline participation or withdraw from the study at any point without facing any negative consequences or penalties. Additionally, consent for using individual data was obtained from each participant.

STANDARDS OF REPORTING

STROBE and SAGER guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of this article are available in the Panya_Data support article at https://docs.google.com/spreadsheets/d/1khc6eSwD1CHqXti2a9-bj97HUgnbBri8ly1n3KEiLfc/edit?usp=sharing.

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None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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