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Research Paper

Implementation and evaluation of the peer-training program for village health volunteers to improve chronic disease management among older adults in rural Thailand

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ABSTRACT

Objectives: This study aimed to investigate the effect of a peer-training program for village health volunteers (VHVs) to improve chronic disease management among older adults in rural Thailand.
Methods: The study was guided by community-based participatory research (CBPR). The peer-training program was developed by engaging diverse stakeholders, including community organizations, healthcare services, VHVs, older adults with chronic illnesses, and folk scholars in remote communities with high healthcare needs. The peer-training program comprised a three-day training workshop that convened once a week for three weeks with the following six sessions: knowledge sharing, peer support and empowerment, health literacy and health behavior, the general caring procedure for older adults with chronic illnesses, information sharing and communication, and home visit. From January to April 2021, a total of 28 VHVs completed the peer training program in a rural area in Chiang Rai province, Thailand. The Health Literacy and Health Behavior-3E2S (HLHB-3E2S), the Management of Non-Communicable Diseases Questionnaire (MNCDQ), and a self-confidence questionnaire were used to survey pre (week 1) and post-intervention (week 12), respectively. Then VHVs were interviewed to collect attitudes, and opinions about the intervention.
Results: After the intervention, the HLHB-3E2S scores (49.39 ± 5.54 vs. 52.35 ± 4.26, $P = 0.001$), the MNCDQ scores (44.10 ± 6.27 vs. 50.60 ± 4.84, $P < 0.001$), and the self-confidence questionnaire scores (22.28 ± 2.46 vs. 23.21 ± 1.81, $P = 0.01$) of VHVs significantly increased. VHVS also reported that the peer-training program enhanced their healthcare services, including health education, chronic disease management, leadership skills, and improving their relationship with healthcare providers.
Conclusion: Peer training programs are a practical strategy to improve VHVs' capacities.
Healthcare professionals should provide a continuous training program for VHVs with their peers to increase capacities, confidence, and satisfaction in caring for the older adults with chronic diseases in the community.

What is known?

- Health care in Thailand faces significant human resource challenges in underserved areas and using village health volunteers (VHVs) is the inclusive strategy to deal with these problems.
- Many VHVs programs failed to deliver healthcare services due to poor design and implementation.
- To improve the ability of VHVs, they need to receive appropriate training and support from supervisors and peers.

What is new?

- Peer-training programs can increase VHVs' confidence, knowledge, and satisfaction and have strengthened their

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chronic disease management skills in resource-poor communities.
- The integration of VHVs peer-training program into both health care systems and municipal health systems is a key challenge for sustainability.

1. Introduction

Thailand currently has the third most rapidly aging population in the world [1]. Approximately 13 million people in Thailand are now aged 60 years or above, accounting for 20% of the population, and this number is expected to increase to 20 million, accounting for 33% of the population, by 2040 [2,3]. This means that one out of every three Thais will be an older person [4]. The challenge of an aging population is coupled with the high prevalence and incidence of chronic non-communicable diseases (NCDs), such as hypertension, diabetes, stroke, and coronary artery diseases, which make older adults more vulnerable to disabilities that require special continuing care [5–7]. In Thailand, as in many low-to-middle-income countries in transition, failure to effectively implement evidence-informed intervention for older adults with chronic diseases represents a key obstacle in the progress of the healthcare system, resulting from the high burden of disease and the extreme shortage of human and material resources [8]. Thailand also faces major barriers to providing health promotion and optimal care for older adults, especially those in rural areas, due to a lack of access to quality healthcare services, poverty, and low health literacy [9–11].

A potential solution for delivering care to older adults could be task-shifting – a process whereby tasks are moved to village health volunteers (VHVs) or community health workers, which is expected to reduce healthcare expenses and help older adults manage chronic conditions [12,13]. In Thailand, VHVs have played a key role in the primary healthcare system for a decade. VHVs act as a mitigating factor in the healthcare resource crisis by providing essential care for older adults at the household and community levels, reducing inequality in healthcare for a vulnerable population, and creating a link between the healthcare system and the older adults with chronic illnesses in the community. They carry out health surveys and administer health promotion and disease prevention campaigns through home visits and health education sessions, particularly for older adults with chronic diseases at the district and subdistrict levels [14,15]. However, as VHVs face obstacles that affect their competencies, including failure to be fully integrated into the primary care team, inability to identify health needs because of limited resources and knowledge, and low confidence, there is a need to improve their competencies and identity [13,16].

To enhance VHVs' competencies, targeted and well-developed support systems should be provided. However, growing evidence indicates that VHV programs have failed to deliver high-quality healthcare due to poor design, implementation, and support [16,17]. Previous studies have reported that VHV training programs did not cover all necessary areas and were not up-to-date with current levels of medical knowledge and skills, leaving VHV uncertain of their competence [9,18]. Many VHVs work alone in relatively remote areas, and despite being under the guidance of healthcare professionals, VHVs lack effective support from their peers when caring for older adults in the community. This lack represents a barrier to improving chronic disease outcomes for older adults at the community level [19–21].

Peer-to-peer support is known to be a promising approach to supporting VHVs in community-based work. Peer training programs, which involve working with other VHVs, have been used and proven effective for a wide range of health issues and have strengthened VHVs' ability to implement care to address chronic disease needs in the local environment. Peer training can also promote VHVs' communication skills and improve their emotional expression and knowledge [21,22]. There is, however, less scholarly consensus and no specific program related to peer support in Southeast Asian countries, including Thailand VHVs. Most focus only on direct peer-to-peer support programs for older adults with chronic diseases. Thus, it is important to develop peer-training programs to improve the performance and advance the careers of VHVs in these regions.

This study aimed to develop a peer-training program and examine its effectiveness by conducting a pilot study to inform a future major trial. This program is based on the expectation that VHVs will not only learn themselves but also train others, leading to a sustainable education program that offers VHVs support while they provide health services for older adults in the community to manage their diseases [16,23]. This peer-training program may also contribute to the robustness of standardized training by focusing on the learner, personal experiences, group learning, and a reciprocal teaching-learning relationship [20].

2. Methods

2.1. Study design

The study was conducted in a rural area in Chiang Rai province, Thailand. Enrollment took place at the subdistrict health promotion hospital (SDHPH). The peer-training program was delivered by a research team and nurse practitioners with experience working with VHVs at the community level [24]. To test the feasibility of the peer-training program, we used a noncontrolled pretest-posttest pilot design. At the end of the study, research questionnaires and focus group discussions (FGDs) were conducted to evaluate the program's feasibility.

2.2. Participants

The target population included 224 VHVs working in two districts and serving a catchment population of approximately 1,500 households. The VHVs were recruited by the nurse practitioners at monthly meetings. Eligible participants comprised 78 VHVs who had more than five years of experience in caring for older adults with chronic diseases and were willing to participate in the program. The exclusion criteria were as follows: 1) not giving consent for data collection and 2) not completing the project process. After applying these criteria, 28 VHVs were recruited and assigned to the intervention. This number was consistent with recommendations for pilot and feasibility studies, in which samples of 10–20 participants per group have been deemed adequate to assess feasibility outcomes [25].

2.3. Development of the peer training program

The peer-training program intervention was developed by engaging diverse stakeholders, including community organizations, healthcare services, VHVs, older adults with chronic illnesses, and folk scholars in remote communities with high healthcare needs, as outlined below [24].

a) Situational analysis. The information was obtained and discussed by the principal investigator (PI) via group meetings and workshops, which were attended by 20 VHVs, five nurse practitioners, ten older adults with chronic illnesses, five public health officers, five folk scholars, and five community leaders in the meeting room SDHPH. During this phase, the participants

were encouraged to share their opinions, perceptions, and experiences regarding care for older adults with chronic diseases in rural communities, as well as their training needs, activities, and materials. Questions included: "What are your needs for improving your care competencies?" "Please tell me more about what the other VHVs do to help you when caring for older adults in the community." "Please tell me more about your challenges and barriers when visiting older adults with chronic diseases in the community." Participation in the interviews and FGDs was completely voluntary.

b) Initial development. In this phase, the PI engaged in four FGDs with the key informants and the research team. The discussions focused on the participants' ideas about how to build the peer-training program on caring for older adults with complex diseases. Open-ended questions were used to obtain data and included: "What do you think about the current healthcare services for older adults with chronic diseases delivered by VHVs?" "What is could help VHVs improve their health services?" "What possible goals for caring for older adults with chronic disease do you want to achieve?" Based on the information obtained, the first draft of the peer-training program and a handbook were developed, and the first round of expert consultation was undertaken to ensure scientific accuracy. The experts comprised one family medicine practitioner and two nurse practitioners, who reviewed and provided feedback on and evidence in these drafts. The program was revised and updated following their guidance [25,26].

c) Refinement of the peer-training program. After revising the program, the final draft versions were presented to the 10 VHVs, 20 older adults with chronic illnesses, five community leaders, five nurse practitioners, and three public health officers during a community meeting, which was also attended by two family medicine practitioners and three nurse practitioners as a second round of experts. The experts reviewed all content, including the core training materials and the handbook, with the participants for cultural appropriateness and contextual relevance (e.g., diet, exercise, rural context, housing conditions, social relationships, and common practice) before the pilot study [26].

2.4. Program intervention

The VHV peer-training program was composed of six modules of 90–120 min led by the principal investigator (KP) and research members (KM, PM, and OS) covered over a three-day training workshop that convened once a week for three weeks. The effectiveness of the peer training program is evaluated after 12 weeks of follow-up.

Session 1 (week 1, day 1/1) began with 30 min of addressing gaps in the VHVs' knowledge about the intervention and their motivations to improve their competency by encouraging the VHVs to express their experiences to establish a relationship and trust. General information related to older adults with chronic illnesses was provided in the following 60 min. The information included care concepts for active older adults, home-dependent older adults, and bedridden conditions. The session also provided opportunities for interaction and communication with peers.

Session 2 (week 1, day 1/2) began with 30 min of peer-mediated activities to encourage the VHVs to share their previous experiences. The small group discussion and training then focused on peer support and empowerment for 60 min. The VHVs also learned the concept of self-esteem and how to work with peers in different situations for 60 min. Finally, the handbooks for caring for older adults with chronic illnesses were distributed. The instructors explained how to use the handbook and to make notes to report to healthcare providers.

Session 3 (week 2, day 2/1) began with 30 min of small group discussion on previous knowledge related to health literacy and participants' experiences of the health behaviors of older adults. The topics of health literacy, digital literacy, telehealth, and health behaviors according to 3Es (eating, emotion, and exercise) and 2Ss (stop smoking and stop drinking) were present for about 60 min.

Session 4 (week 2, day 2/2) was carried out in small groups, with VHVs assigned to train with peers on care procedures for adults with chronic illnesses, such as nasogastric tube care, feeding, physiotherapy, ostomy care, emergency care, and basic life support for 120 min. Each VHV was required to interact with another to develop their competencies and relationships.

Session 5 (week 3, day 3/1), which centered on information-sharing and communication, began with 15 min of peer activities to encourage VHVs to share their previous experiences and difficulties related to obtaining and sharing information. The small group discussion and training then focused on feedback delivery from peers for about 60 min. The effect of decision-making on older adults' health situations was also discussed for 30 min.

Session 6 (week 3, day 3/2) constituted a home visit to demonstrate strategies for monitoring older adults' health conditions for about 30 min. A home visit demonstration and procedure were performed for 30 min. The small group discussion and training then focused on health education and reporting for about 90 min.

Subsequently, each pair of VHVs was assigned to care for four to six older adults with chronic diseases, and telephone follow-up was conducted at weeks 2, 4, and 12. The telephone conversations aimed to identify barriers to or opportunities for supporting the VHVs while they worked with their peers. The contents of the intervention were included in the provided handbook on caring for older adults and shared with the community leader to broadcast to the community as a form of health education.

2.5. Data collection

In the implementation and evaluation of the program, data collection was conducted by the research team from the baseline (week 1) to week 12 (January–April 2021). Face-to-face interviews and FGDs took place in the SDHPH meeting room by using the three questionnaires described below.

The Health Literacy and Health Behavior-3E2S (HLHB-3E2S) is a multiple-choice questionnaire adapted from a self-administered questionnaire on Thai people's health literacy levels constructed by the Health Education Division, Ministry of Public Health, Thailand [22] to assess health literacy and healthy behavior among VHVs based on the 3Es and 2Ss . This instrument comprises 4 parts, including 1) understanding of chronic disease and health services; 2) access to health information, health services, knowledge transfer, and sharing, and disease management; 3) decision-making skills to choose practices; and 4) health behaviors related to 3E2S. The possible scores range from 0 to 68 points. The reliability index for the HLHB-3E2S was 0.89, KR 20 was 0.516, and in this study was 0.88.

The Management of Non-Communicable Diseases Questionnaire (MNCDQ) is a self-administered questionnaire developed by the research team based on the work of Lorig and Holman [27]. This instrument uses a four-point Likert scale (0–3) and comprises 20 items. The VHVs were asked to rate their ability to manage and

advise the older adults with chronic diseases under their responsibility, including NCD knowledge, coping and stress management techniques, self-monitoring, adherence to medication, and treatment when diagnosed with chronic illness. The potential scores range from 0 to 60 points. A higher score indicates higher management competency for chronic diseases. This measurement showed good internal consistency and reliability, with a Cronbach's α coefficient of 0.78.

A self-reported questionnaire was also used to assess confidence in the VHV peer-training program. The instrument, which was developed by the research team, consists of five items and uses a five-point Likert scale ranging from 1 (completely disagree) to 5 (completely agree). The possible scores range from 0 to 25 points, with a higher score indicating higher confidence in the program's implementation. This measure showed good internal consistency and reliability, with a Cronbach's α coefficient of 0.90.

Feasibility was assessed based on the recruitment numbers, attendance, and completion rate of the intervention sessions and FGD to determine if a future main trial is possible and desirable. The open-ended question included; "Do you feel confident when are you visiting the older adults at home with peers?" "Do you think the peer-training program would be effective in improving disease management skills for VHVs?" "Were you able to complete the activities in the peer training program you want to?" "What did you like most about the peer training program? Why?" "What did you like least about the peer training program? Why?"

2.6. Data analysis

Data were analyzed in the following data collection procedures. The qualitative data were analyzed using a content analysis method [28], assisted by the qualitative software package NVivo version 12. The baseline demographic characteristics of age, gender, and ethnicities were described using frequency and percentage. A paired *t*-test was used to determine a comparison of the change in VHVs from pre-test to post-test conditions by IBM® SPSS statistics version 26.

2.7. Ethical approval

All research protocols were performed by relevant guidelines and regulations. Ethical approval was obtained from the Human Ethics Research Committee (CRPPHO 12/2562). The purpose, risks, confidentiality, and benefits of the study were explained to the participants before they agreed to participate. All participants had the right to refuse participation and withdraw from the study at any time without penalty.

3. Results

The results from this study are reported according to the extended CONSORT guidelines for reporting pilot and feasibility studies [29].

One-hundred percent of the VHVs ($n = 28$) completed the training program and submitted the questionnaires. The VHVs ranged in age from 28 to 67 years (average 53.08 years). VHVs were predominantly female (71%) and the majority (64%) had participated in primary school or lower. The majority were married (79%), half of the participants were employed (57%), and 43% had incomes $\leq$ US$ 145 per month.

The VHVs and their peers were each assigned to care for 4–6 older adults with chronic diseases. All 28 VHVs in the intervention group completed the peer training program. The peer training program had appreciable effects on three outcome measures, with a significant difference between the baseline and week 12 (Table 1.)

All 28 VHVs in the intervention group were retained and adhered to the program. After participating in the peer training program, VHVs reported successfully engaging with the older adults with chronic diseases and they could effectively communicate regarding disease management and health screening (vital signs and blood glucose testing) through peer support and use of the handbook, especially during home visits.

> *"I've just finished secondary school and my peers got a primary school*
>
> *degree … we know much better when receiving the training program and peers give me confidence … we could help each other."* (VHV13)
>
> *"After working with my friends, I felt more comfortable … and not scared to care for the older people …"* (VHV08)
>
> *"… the handbook is very useful … it is able to give advice like a nurse and is easy to understand."* (VHV24)
>
> *"… I am very happy to work with my friends because when I did not know in something we can help each other and it safe to go in some place … we are not alone …" (VHV03)*
>
> *"I can take care of the older adults and provide the relevant health education, but sometimes I could not do complete my duties because I do not know how to explain the disease and the guidance … however, when I worked with my friends they help me to communicate with the older adults as well as their families …" (VHV10)*
>
> *"A strong relationship between VHVs and the nurses who are our supervisors … encourage me and my VHVs friends to help our seniors and community."* (VHV 02)
>
> *" I believe this program should be continued because it helps VHVs to improve their knowledge and skill … for me … after program completion, I feel more confident when working in the community with other VHVs."* (VHV 09)

4. Discussion

VHVs—Thailand's community health workers—have long been recognized as an international model for community-based public healthcare and acclaimed as a global success by the World Health Organization [4,20]. VHVs can play a role in improving health behaviors, navigating complex health systems, coordinating care, and advocating for patients throughout their lifetimes [30].

In this study, the VHVs were likely to be older adults, established, and respected in the community, despite having little formal education. The feasibility of the peer-training program was supported by advances in knowledge, chronic disease management skills, and confidence to improve health behaviors among older adults in the community [9]. The key factors of the program included a supportive environment, participatory learning, small-group discussions, and activities with feedback. Small-group discussions also provided an opportunity to share ideas and experiences of caring for older adults at the community level [26,31]. The VHVs in the peer training program demonstrated positive outcomes due to working with their peers and receiving extra help and support [20,26]. Informal relationships were also very important for VHVs, especially in unfamiliar environments, as they provided a sense of safety and helped the VHVs gain more confidence in delivering services in their communities. These findings are consistent with previous studies demonstrating that peer-to-peer support programs promote chronic disease management skills,

Table 1
The HLHB-3E2S, MNCDQ and a self-confidence questionnaire score of VHVs pre- and post-intervention ($n = 28$).

Subscale	T0 (baseline)	T1 (week 12)	*t*	*P*
Knowledge (HLHB-3E2S)	49.39 ± 5.54	52.35 ± 4.26	3.701	0.001
Chronic disease management (MNCDQ)	44.10 ± 6.27	50.60 ± 4.84	7.628	<0.001
Self-confidence questionnaire	22.28 ± 2.46	23.21 ± 1.81	2.788	0.010

Note: Data are *Mean* ± *SD*. HLHB-3E2S = the Health Literacy and Health Behavior-3E2S; MNCDQ = the Management of Non-Communicable Diseases Questionnaire.

knowledge, and increased social support for older adults with complex diseases [20,21,31–33].

Identifying and developing core program activities was a challenge. The design and development of the program were guided by CBPR and involved key stakeholders to allow the program to be tailored based on knowledge gaps, resources, and the cultural context of the community [26,34,35]. This development strategy was accompanied by other factors that facilitated a supportive environment, such as a handbook, supervision, and feedback from the stakeholders to ensure that the program objectives were consistent with research expectations and overcame barriers [20,30,32,34]. Aligning with previous research, the findings demonstrated that participatory support from healthcare providers was associated with the better integration of VHVs into teams and that understanding and appreciating VHVs may make a valuable contribution to community development [17,36–38].

The primary results add to a growing body of literature indicating that peer-to-peer support is feasible to implement and acceptable to VHVs who work in low-resource areas. This program also demonstrated that training sessions based on community needs can increase VHVs' skill competencies and have positive outcomes for older adults with chronic diseases in terms of disease management, continuing care, flexibility, and accessibility services [4,13,30,36]. Moreover, Choowong et al. [11] reported that care service delivery by VHVs in their communities allowed VHVs to make themselves heard and demonstrate their competency to healthcare professionals, which enhanced healthcare professionals' confidence in working with VHVs [39,40].

The results of this study have several implications for professionals working in rural healthcare settings with VHVs. The VHV peer-training program has the potential to improve VHVs' capacities as well as accessibility to care services for older adults with chronic diseases. To further strengthen the program, future research might include a randomized control trial with a longer follow-up period to evaluate the program's effectiveness and sustainability.

5. Limitations

This study has several limitations worth considering. The pilot study lacked the power to verify the effectiveness of the program due to the small sample size and short duration; thus, the findings may not be generalizable to other settings.

6. Conclusion

Overall, the study findings of the implementation of the peer training program for VHVs who work in low-resource areas in Thailand are feasible. This pilot feasibility study adds to the richness of the care delivery strategy in that the peer training program has the potential to improve VHVs' capacities by providing supporting information, mental support, and materials during the delivery of care for the older adults with chronic illnesses. This program could also improve service accessibility and reduce the burden created by the shortage of healthcare professionals at the community level. Healthcare professionals should provide a continuous training program for VHVs with their peers to increase capacities, confidence, and satisfaction in caring for the older adults with chronic diseases in the community.

CRediT authorship contribution statement

Khanittha Pitchalard: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Data curation, Writing-original draft, Funding acquisition. **Katemanee Moonpanane**: Conceptualization, Supervision, Writing-review and editing. **Pawadee Wimolphan**: Methodology, Investigation, Validation. **Onnalin Singkhorn**: Investigation, Visualization. **Sathit Wongsuraprakit**: Investigation, Visualization.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability statement

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijnss.2022.06.011.

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