

A Health Literacy Initiative: Enhancing Health Behavior and Quality of Life for Socially Bound Aging in Northern Thailand

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Abstract Background: Health literacy improves outcomes, especially for socially bound aging (SBA) who become homebound. This study aims to create novel activities to encourage SBA to adopt health behaviors (HB) that improve their quality of life. **Method:** This action research created and assessed the northern Thailand SBA health literacy (HL) program. Purposive and two-stage cluster sampling selected 10 supporters, 192 participants, and 8 university researchers from 210 participants. Research has three phases: look, think, and act. Data were collected through in-depth interviews, workshops, questionnaires, program evaluations, and post-action reviews. Descriptive, Friedman, and content analysis were used. **Results:** The look phase showed a society with 42.7% low-level aging and a decline in health literacy. SBA think phases last 6 weeks and include 6 activities. The program's brochure, handbook, and self-regulation form promote health decision-making, media literacy, and health communication and management. Implementing the program significantly increased HL, HB, and QoL scores during the act phase (p-value <0.001). AAR also found that SBA reflected QoL-improving programs and understood the content better. **Conclusions:** The SBA health literacy program improved HL, HB, and QoL. They should be used

by health agencies to plan SBA activities in the study area and similar demographic areas.

Keywords Socially Bound Aging, Health Literacy, Health Behavior, Quality of Life, Action Research

1. Introduction

The World Health Organization projects that the proportion of individuals aged 60 and beyond will rise from 1 in 6 to 2.1 billion by 2025, up from 1.4 billion in 2020 [1]. Thailand is expected to transition to a complete-aged society by 2021, and by 2031, it will progress further to become a super-aged society. Statistics indicate that more than 28% people fall into the older demographic group [2]. The analysis found that 96.89% of the overall elderly population were socially bound aging and able to carry out daily activities, as assessed by the Barthel activities of daily living with a score beyond 12 points [3]. However, in the future, the socially bound aging will transition into the old population, who will rely on it due to the natural decline of their bodies especially brain function [4] and the presence

of both genetic non-communicable and communicable diseases [5].

A person's quality of life is shaped by culture and values, which shape their goals, expectations, standards, and priorities and balance their perceptions of physical health, mental health, belief, social relationships, and the environment [6, 7]. Genetics, environment, health behaviors, comorbidities, and health literacy all affect quality of life [8-10], according to the research. As previously stated, elderly people engage in inappropriate behaviors that cause communicable and non-communicable diseases. It originates from low health literacy [11].

Enhancing the well-being socially bound aging entails a high standard of living. To mitigate the strain on society and delay their own decline, socially bound aging can achieve this by leading contented lives within the community and with their families, thereby averting the need for external assistance in maintaining their well-being. Hence, it is imperative to foster its promotion through the organization of activities aimed at enhancing the socially bound aging's health literacy, thereby facilitating the adoption of appropriate health behaviors and serving as a compass for ensuring a high quality of life among the socially bound aging in both present and future societies.

Previous studies on the aged have included observation studies [5], systematic reviews [4, 12], quasi-experimental research [6, 10, 13, 14-16], and action research [17, 18, 19]. The quasi-experimental research design evaluates the efficacy of programs created by researchers. There are limited action research designs focused on developing activities for the elderly, such as emergency care [17] and prehospital care [18]. However, Singhasem et al. [19] conducted a study using action research to enhance health literacy among the elderly in southern Thailand. Action research prioritizes the health issue within a specific location. It necessitates the collaboration of community members to affect changes within the community. The changes in following occurrences in the community result in novel knowledge about the context of community [20-22].

As stated previously, the research team was tasked with establishing how to generate new knowledge via integrating the community-based action research concept of Senge and Scharmer [21] with the action research concept of Stringer and Aragon [20, 22] in order to design a program that could enhance the health literacy, health behavior, and quality of life of socially bound elderly in northern Thailand. After using the application, does it significantly improve health literacy, health behavior, and quality of life scores? This study used the Short Form-12 Health Survey (SF-12) [23] to measure quality of life instead of the World Health Organization instrument [24] used in previous investigations. This study takes a distinct approach by only focusing on health literacy, unlike previous research. The aim was to create a health literacy initiative targeting socially bound aging in northern

Thailand, with the goal of influencing their health behavior and improving their quality of life. Additionally, the program's effectiveness was evaluated.

2. Materials and Method

The research design employs action research methodology, incorporating the concepts proposed by Stringer and Aragon [20, 22] as well as Senge and Scharmer [21].

2.1. Area Study and Participants

The study area was conducted in the Complete Aged Society sub-district in Phayao Province [25], and the community leader willingly participated in this study. The study involved three groups, all consisting of 210 participants, as follows:

2.1.1. The supporters

The supporters consist of 10 individuals, including village leaders, 5 leaders of village health volunteers (VHVs), one leader who was elderly, and the director of the Sub-district Health Promotion Hospital (SDHPH). The participants were chosen using purposive sampling, which involved selecting individuals who had lived in the studied area for at least 5 years.

2.1.2. The practitioners are divided into 4 groups of 192 members as follows

- 1) The first group were at least 5 VHVs residing in the study area for a minimum of 5 years included.
- 2) The second group were 5 healthy and unhealthy socially bound aging chosen via snowball sampling.
- 3) The third group were 150 healthy aging, sampled by two-stage cluster sampling by randomized 5 villages from 18 villages then randomized 30 aging from 5 villages, age group 60 and over who reside in the study area for a minimum of 5 years, voluntary to give information were included; and the last group included 30 socially bound seniors who were calculated by the Cohen formula [26] and chosen using purposive sampling. The inclusion criteria for this group were as follows: (1) they had low health literacy scores ranging from 12 to 16 on the ADL index during the look phase of the survey [27]; (2) they did not have any serious diseases or difficulties associated with eating, movement, excretion, or brain disorientation; (3) they were literate; and (4) they were willing to participate in the study for its duration. Individuals whose health conditions impeded data collection or enrollment were ineligible to participate in the study.

2.1.3. The researcher team

They comprised 8 participants from the university, all of whom were lecturers and master's students.

2.2. Phase of Conducting Research

This research was divided into 3 distinct phases: the look, the think, and the act phases.

The look phase was situation analysis by using health literacy survey and deep interview supporters group. The look phase involves a comprehensive analysis of the situation, during which the research team conducts in-depth interviews with both support groups and practitioners who have and do not have chronic illnesses. Subsequently, the researchers conduct a survey to the 150 individuals who were healthy aging in order to collect data through surveys and interviews.

The think phase entails utilizing the findings from the look phase to create a preliminary health literacy program through collaboration among a team of researchers. Researchers then present this preliminary program in a workshop setting to support groups and research teams, aiming to reach a consensus on an implementation program using the workshop guidelines.

The act phase represents the ultimate stage of the research process, whereupon the outcomes derived from the think phase were implemented. This phase comprises two steps, with the following: 1) The program introduced a health literacy initiative during the think phase for socially bound aging and those with limited literacy skills. 2) The assessment of the implemented program encompasses both quantitative data and measured intervention three times by the research team: before program implementation, following a duration of 6 weeks, and following 8 weeks of program implementation. The qualitative evaluation employed the AAR guidelines at the end of the intervention, at 6 weeks and 8 weeks following the program implementation.

2.3. Tools of this Research

Research tools encompass the instruments employed for data collection and the programs derived from developments made during the think phase. These tools comprise the subsequent:

- 1) In-depth interview guidelines were used in the look phase to utilize comprehensive interview guidelines to collect data from supporters and practitioners on VHV's and unhealthy and healthy aging. The focus was on gathering information about community context and the health literacy of aging.
- 2) Health literacy questionnaires for a survey in aging, including socio-demographic variables and regarding food consumption, emotion, exercise, reducing smoking, alcohol, and body weight, were applied from past research [28]. A total of 72 points includes the following six components: knowledge and understanding (7 items, 7 points); access to information and health services (2 items, 10 points); health communication (3 items, 15 points); health management (3 items, 15 points); media literacy (2

items, 10 points); and practice judgment (3 items, 15 points).

- 3) The guidelines workshop was developed based on the findings from the look phase, which included the results of the health literacy survey, interviews, and identified areas for enhancing health literacy, health behavior, and quality of life for the aging.
- 4) The program test was divided into 3 parts: Part 1 Health literacy questionnaires were used in the look phase; Part 2 was health behavior regarding food consumption, emotion, exercise, reducing smoking, alcohol, and body weight, as applied from past research [28]. The six-item, 30-point rating scale was in health behavior. The positive questions had five levels: 6–7 days a week = 5 points; 4–5 days = 4 points; 3 days = 3 points; 1–2 days = 2 points; no practice = 1 point. However, the negative questions had five levels: 6–7 days a week = 1 point; 4–5 days = 2 points; 3 days = 3 points; 1–2 days = 4 points; doing nothing = 5 points.; and Part 3 Quality of life (QoL) applied the principle of Thai version [29] short-form with 12 items with Cronbach's Alpha = 0.73 and 0.77 in the physical and psychological categories and needed four-week samples. Physical domain items 1–26 were 1, 2, 3, 4, 5, and 8, whereas psychological domain items 6–30 were 6, 7, 9, 10, 11, and 12. The questionnaire rating scale had 5 negative questions: never =5, sometimes =4, fairly =3, frequently =2, and always =1, and 5 positive questions: never =1, sometimes =3, fairly =3, frequently =4, and always =5. For items 2 and 3, we assigned 1 = big difficulty, 2 = slight problem, and 3 = no problem. The minimum and maximum QoL scores were 12 and 56.
- 5) The After Action Review (AAR) guidelines [30] were employed during the act phase in groups engaged in program activities. The purpose of this evaluation was to assess the quality of the program. The evaluation includes questions that aim to gather information about the program's expectations, outcomes, and guidelines for improvement.

2.3.1. The develop program

It was created during the think phase, drawing upon the principles of developed health literacy [31] and Bandura concept [32]. The program provides a comprehensive overview of the activities, methodologies, educational resources, tools, and time required for program implementation.

2.4. Ethic Consideration

Prior to beginning the project, the research team submitted the research proposal to the University's Ethics Committee for Research. The University of Phayao Research Committee, under the reference number UP-HEC 1.2/054/64, granted approval for this research. Upon obtaining authorization, the research team proceeded with

the research in accordance with phase 2.2 and employed the tools detailed in section 2.3.

2.5. Data Analysis

The data analysis comprised three phases: 1) The look phase involved qualitative analysis using content analysis of in-depth interviews done within the community setting. Older community members with poor behaviors who demonstrate constructive behavior offered vital insights into the health of elderly individuals. Quantitative analysis entailed examining data collected from a study on health literacy in elderly people who are in good health. 2) The think phase involved domain techniques conducting qualitative analysis on workshop content; and 3) The act phase used qualitative analysis to examine AAR information. The data were evaluated using the Friedman test to evaluate the program's impact on health literacy scores, health behavior, and quality of life.

3. Results

3.1. The Look Phase

The outcomes of this stage of research encompass the community context, health literacy surveys, and in-depth interviews, as indicated below:

The community context: Thai researchers are studying a community in Upper Phayao Province's northern sub-district. The study examines northern Thais who settled there 60 years ago. The study area covers 131.696 square kilometers at 19.016348 latitude and 99.913958 longitude. Hills, foothills, forests, lowlands, and plains divide administrative regions into 18 villages with 6,209 households and 15,325 people. Government institutions and organizations have created suburban, semi-rural, and rural social conditions in the study area. The population will work in trade, government service, contract work, field crops, and horticulture, as shown in Figure 1 [25,26].

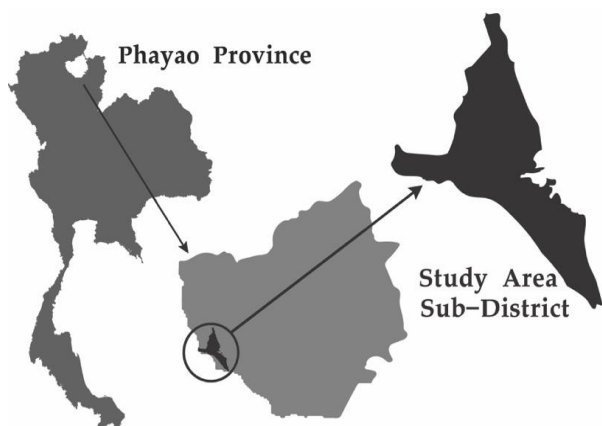


Figure 1. The study area

The health literacy survey revealed that most of the aging were women, accounting for 65.3% of the sample. The mean age of the aging was 68.33 years, and 53.4% of them were married. Furthermore, 86.0% had received education, 55.3% had insufficient income, and 75.3% were employed. Most individuals had a high health literacy level (57.3%), while a smaller proportion had a low health literacy level (42.7%). The mean health literacy score was 46.9, as indicated in Table 1.

Table 1. Demographics characteristic of aging in survey

Demographic characteristics (N=150)	Frequency	%
Gender		
Male	52	34.7
Female	98	65.3
Age years		
60-69	80	57.4
70-79	64	42.6
$\bar{x} \pm S.D.$	68.33 \pm 5.2	
Married status		
Marry	16	53.3
Single	14	46.7
Education		
Illiterate	21	14.0
Educated	129	86.0
Occupation		
Employment	83	55.3
Unemployment	67	44.7
Income		
Not enough	113	75.3
Enough for saving	37	26.7
Health literacy score		
Low	64	42.7
High	86	57.3
$\bar{x} \pm S.D.$	46.9 \pm 6.4	

Concurrently, the qualitative data obtained from conducting in-depth interviews with supporters and a group of 17 aging adults, both with and without chronic illnesses, indicated that the qualitative data have shown that the elderly lack an understanding of proper portion sizes and are unaware of the nutritional value of different foods. Elderly individuals may struggle to understand the importance of appropriate portion sizes and the nutritional value or potential harm of different foods. As a female elder mentioned, "I also consume vegetables as a side dish. Once satisfied, I quit consuming food. There is no need to speculate about the amount of food I consume. On certain days when I lack nourishment, I eat rice and ripe tamarind."

Besides, the elderly lack comprehension regarding the optimal duration of physical activity, and they often turn to alcohol consumption as a means of coping with emotional

stress. As the male elder said, "I engage in physical activity at the temple and tend to the garden by cycling. During times of financial stress that disrupt my sleep, I resort to borrowing money as a solution. When I am stressed about family issues, I resort to consuming alcohol."

Furthermore, the elderly sometimes lack the ability to evaluate the reliability of a product or campaign when deciding to make a purchase. According to older women said *"I will buy a product right away if I was interested in it and need information or if my friend cannot supply details about it. At times, I am deceived by scams, leading to the product being inoperative."*

3.2. The Think Phase

The findings of the workshop comprised a total of 13 participants, consisting of 4 socially bound aging, 4 VHVs, 1 representative from the SDHPH, 1 community leader, and 3 researchers. The act phase will implement the agreed-upon health literacy program for socially bound aging as follows:

3.2.1. The health literacy program for socially bound aging

This program aimed to enhance health behaviors related to food consumption, emotions, exercise, quitting smoking, alcohol intake, and managing body weight. It is based on the principles of advanced health literacy [23] and the Bandura concept [24]. The media resources included a document, a handbook, a brochure focused on promoting health literacy, and a self-monitoring form. The program was implemented among socially bound aging with low health literacy scores. The program's effectiveness was assessed at three different time aspects: prior to implementation, after finished activity at 6 weeks and after finished activity at 8 weeks. The program test was employed to assess the program.

3.2.2. The program's activities are outlined below

Week 1 Activity 1: Getting acquainted as an introduction, explaining the program, and collecting information before joining the program take 60 minutes.

Week 2 Activity 2: Promote access to health information. Spend 60 minutes analyzing and learning about access to

information and channels for communicating health information. This activity uses participatory lecture methods, the fotonovela technique, and the teach-back technique.

Week 3, Activity 3: Enhance knowledge and health understanding. Spend 120 minutes learning with the concept of health literacy through the utilization of fotonovela techniques, participatory lecture, mastery experience, vicarious experience, questioning techniques, teach-back techniques, exercise activities, promoted health menus, and stress management implemented.

Week 4, Activity 4: Enhancing communication skills and self-management skills. The duration of this activity is 120 minutes. It utilizes experience-telling derived from mastery experience, encourages self-care through health maintenance, and promotes the use of a self-monitoring form to track the progress of one's actions in relation to predetermined objectives.

Week 5-6 Activity 5: Media literacy and decision-making to practice. Spend 120 minutes in practicing analysis, accessing health information gate, data verification, and data presentation can be improved by employing the show-me technique and fotonovela technique.

Week 8 Activity 6: It takes 120 minutes to use reinforcement management to incentivize participation in health literacy-promoting activities.

3.3. The Act Phase

Through the utilization of a program developed for evaluating the process of socially bound aging, we discovered that out of the 30 individuals involved in the study, 76.7 % were identified as female, with an average age of 69.33 years. In addition, 53.3 % of the participants were married, 96.7 % had attained an education, and 53.3 % were without employment, with 73.3 % earning an inadequate income.

The program had a significant positive impact on the health literacy scores, health behaviors, and quality of life of the socially bound aging. The increase in these measures was statistically significant for the third time, higher than the outcomes in the second and first times (p-value <0.001, p-value <0.001, p-value < 0.001), as shown in Table 2.

Table 2. Comparison mean score of HL, HB and QL

Variables	n	$\bar{x} \pm S.D.$	Median	X ²	p-value
HL					
Before implemented program	30	41.3±4.6	37.0		
Post implemented program 6 wks	30	47.5±3.8	40.0	48.4	<0.001
Post implemented program 8 wks	30	52.3±3.1	40.5		
BH					
Before implemented program	30	20.7±2.5	21.0		
Post implemented program 6 wks	30	22.0±2.3	22.0	58.1	<0.001
Post implemented program 8 wks	30	23.4±1.8	23.0		
QL					
Before implemented program	30	37.1±5.8	37.0		
Post implemented program 6 wks	30	40.1±4.8	40.0	30.7	<0.001
Post implemented program 8 wks	30	40.7±3.6	40.5		

The analysis of qualitative data obtained from AAR related the effect of the developed program to the fact that 30 SBAs reported experiencing positive effects on their health literacy, particularly in the domains of nutrition and accessing health-related information. Considering the influence on an individual's complete happiness and the affective dimension of interacting with companions to participate in communal endeavours, female SBA who join the developed program mention,

“I am delighted to see my buddies; it made my mind happy. Gathering allows us to acquire the information necessary to discuss healthcare. What is the optimal portion size for food? I possess accurate knowledge. Gathering enables us to understand how our friends prioritize their health. What is accurate?”

4. Discussion

Throughout the three phases of the research process, and health literacy program was developed for the socially bound aging affected by social addiction; this program produced a statistically significant improvement in the mean scores of health literacy, health behavior, and quality of life. Additionally, the program that was developed facilitated the engagement of the elderly in various activities, which enhanced their health literacy, overall quality of life, and offered the psychological benefit of social interaction. This aligns with the notion put on by Stringer and Aragon [20,22], as individuals residing in the explored geographical area and community stakeholders actively engaged in the community problem-solving methodology employed in this study. They experience a sense of ownership through consensus-building; this research is a methodical progression, and reflection leads to changes and the acquisition of fresh findings.

Furthermore, this program incorporates health literacy strategies combined with self-efficacy theory, an influential factor that impacts health behavior and subsequent quality of life outcomes. In parallel to Singhasem et al. [19], who discovered that engaging in action research focused on enhancing health literacy resulted in a significant increase in health literacy scores, Pangsanit and Srisookkum [13] discovered a similar rise in health literacy scores among elderly individuals with diabetes mellitus after their participation in the program. Prior action research conducted on the elderly has facilitated the benefits that participants have obtained from participating in research activities [17,18].

Wongnoy et al. [7], Ya-inn [33], Tanhui et al. [34], Sumpuntharat Tanhui et al. [35], and Khamkor and Duangsong [36] discovered that the program had a significant positive impact on behavior scores of the sample, aligning with the program's consistent effect on higher health behavior scores. The research conducted by Visuttranukul, et al. [6] revealed that the program had a significant positive impact on the quality of life of the elderly participants, similar to the findings of this study.

This study is limited to utilizing action research methodologies on a specific problem in Phayao Province. Researchers need to thoroughly assess the study context and ensure community consensus before conducting any activity. Before starting any activity, researchers must thoroughly evaluate the study environment and obtain participation from the community.

5. Conclusions

The health literacy program for socially bound elderly is specifically designed to cater to individuals with limited health literacy. The main feature of the program is its origin

from a community survey and consensus among stakeholders in Phayao Province, Thailand. It encompasses various aspects such as activities, an eight-week duration, utilization of a health literacy tool, and incorporation of the self-efficacy concept. The program aims to educate socially bound elderly about health literacy, ultimately promoting healthy behavior and improving their overall quality of life.

Phayao Province in Thailand recommends that health agencies develop health literacy programs based on community context and consensus. Health agencies in Phayao Province should identify individuals with limited health literacy related to chronic diseases prior to initiating the program, considering the community's circumstances and consent to enhance health literacy, health practices, and quality of life. These challenges could impact other provinces facing similar settings.

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Conflict of Interest

None.

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