Thai Health Sciences Frontiers
วารสารวิทยาศาสตร์สุขภาพไทยก้าวหน้า
THSF

ORIGINAL ARTICLE

Development of Health Literacy for Medical Cannabis Use in Yangtalad District, Kalasin Province

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☐ **Received:** 1 May 2026 ✓ **Revised:** 12 May 2026 ☑ **Accepted:** 1 June 2026

Citation: Kanlayasonti P. Development of health literacy for medical cannabis use in Yangtalad District, Kalasin Province. Thai Health Sciences Frontiers. 2026;1(2):58-72.

Abstract

This research and development study aimed to examine the situation, develop a model, and evaluate the effects of enhancing health literacy on medical cannabis use among the general public and network partners in Yangtalad District, Kalasin Province, from January 2023 to October 2025 (34 months). The sample comprised 470 members of the general public and 470 network partners (n = 940), selected by proportionate simple random sampling across 15 sub-districts. Instruments were group processes for model development, an emergency-department case record form, and a seven-domain health literacy interview (total score 45; Cronbach's alpha = 0.86). Data were analyzed using descriptive statistics, paired t-test, independent t-test, and chi-square test, and verified through in-depth interviews, focus groups, and content analysis.

Before the development (January–March 2023), 286 cannabis-related patients visited the emergency department; the most common symptom was dry mouth and throat (24.13%) and the main purpose of use was recreation (48.25%). After the development (July–September 2025), visits decreased to 149, and use for cooking (42.28%) and medical purposes (38.26%) increased (χ^2 = 35.49, p<0.001). Health literacy among the public and network partners (n = 940) rose significantly from a low level ($\bar{x}$±S.D. = 32.95±2.72) to a moderate level (37.74±2.51) (t = 41.25, 95%CI = 4.56–5.02, p<0.001), with no difference between groups afterward (p = 0.625). The model comprised seven components: joint situation analysis; a committee with assigned duties; a medical cannabis education and service clinic; personnel training; support for sub-district health promoting hospitals; health literacy promotion through community enterprises; and surveillance of former drug-use groups through networks and communities. Districts with similar contexts may adopt this model, with continued surveillance of former drug-use groups, emergency-management training, and health literacy promotion.

Keywords: Medical cannabis, Health literacy, Network partners, Research and development

Introduction

Cannabis is the most widely used drug in the world. The World Drug Report 2025 of the United Nations Office on Drugs and Crime (UNODC) estimated that approximately 244 million people used cannabis in 2023, or 4.6% of the population aged 15–64 years.[1] Some users combine it with other drugs such as heroin, cocaine, and methamphetamine, and use is common among adolescents and working-age adults. Globally, cannabis has been promoted following the approach of developed countries that permit smoking or its use as a food ingredient. The United Nations removed cannabis from Schedule IV of the most dangerous drugs to allow more research and medical use, mainly for nausea and vomiting, chronic pain, spasticity, and seizures, although its efficacy remains limited and evidence is still scarce.[2] Long-term use reduces immunity; smokers face risks of respiratory disease and cancer similar to tobacco; cardiovascular effects may include myocardial infarction; and use may also cause infertility, nausea and vomiting, and reduced perception or consciousness.[3,4] Inappropriate dosing most commonly causes tachycardia (about 30%), and other symptoms may include apnea, cyanosis, bradycardia, hypotonia, and severe dystonic posturing.[5] Thailand classified cannabis as a Category 5 narcotic under the Narcotics Act (No. 7) B.E. 2562 (2019), but physicians could prescribe it for medical purposes only in necessary individual cases. On 9 June 2022, the Ministry of Public Health issued the Notification on Controlled Herbs (Cannabis) B.E. 2565, designating cannabis and cannabis extracts (genus Cannabis) as controlled herbs and allowing persons aged 20 years and over to possess, use, care for, store, transport, and sell cannabis, while prohibiting smoking in public places, use by pregnant or breastfeeding women, and sale to persons under 20 years or to pregnant or breastfeeding women.[6] Subsequently, the Ministry issued the Notification on Controlled Herbs (Cannabis) B.E. 2568, effective 26 June 2025, which repealed the 2022 notification and designated only cannabis inflorescences as controlled herbs for medical use, requiring a physician's prescription.[7]

Kalasin Province promoted cannabis, hemp, and kratom as the "three economic crops" and as alternative cash crops for farmers, except for inflorescences containing more than 0.2% tetrahydrocannabinol (THC); it also promoted the use of five cannabis formulations and established three pilot medical cannabis clinics.[8] Yangtalad was the first district in Kalasin Province to establish a medical cannabis clinic, using cannabis for cancer, Parkinson's disease, and epilepsy and to relieve inflammation and pain. Since 2020, in collaboration with Kamalasai Hospital, the Yangtalad Thai Herbal Plant Community Enterprise has grown cannabis and supplied it to Kamalasai Hospital, which produces licensed cannabis-based herbal medicines for patients who require such treatment.[9] Nevertheless, in January–March 2023, at the start of this study, 286 cannabis-related patients still presented to the emergency department of Yangtalad Hospital, mostly for recreational use (48.25%) rather than medical use (21.33%), reflecting misuse and inadequate health literacy among the public.

Health literacy is a concept promoted by the World Health Organization for global health at the 7th Global Conference on Health Promotion in Nairobi, Kenya.[10] It is associated with appropriate health behaviors, good health, and media literacy that lead to behavior change. The Department of Health has defined the basic components of health literacy that enable people to maintain their own health and advise their families.[11] The expansion of social media requires critical judgment to distinguish credible information. Health literacy is now highly important in an era in which cannabis is used for medical, culinary, or recreational purposes, in order to shape appropriate behaviors and reduce the systemic and individual health impacts of cannabis use.[12] Thailand has endorsed this concept to maintain good health in the dimensions of self, family, society, online media, critical judgment, information discernment, and practice leading to health skills.[13] Related studies include the development of a surveillance network and health literacy promotion for medical cannabis use among people in Nakhon Nayok Province[14] and a survey of cannabis-use health literacy among people in Phanna Nikhom District, Sakon Nakhon Province.[15] However, studies that develop a model using network partners and communities as the main mechanism, follow outcomes continuously at the district level for more than two years, and compare health literacy between the general public and network partners remain limited. This study aimed to fill this knowledge gap.

Thailand is now facing a transition from cannabis as an illegal substance to an era of liberalized cannabis. Traditional community knowledge existed but had long been unused, and people often rely on trial and error, leading to incorrect, unsafe, excessive, or inappropriate use. With the 2025 legal change restricting cannabis inflorescences to medical use, the public and network partners need accurate and up-to-date literacy even more. The researcher therefore aimed to develop a model to address these community problems appropriately and sustainably over 34 continuous months (January 2023 – October 2025). The findings are expected to guide districts with similar contexts, health service units, and network partners in promoting health literacy and reducing harm from inappropriate cannabis use.

Research Objectives

1) To examine the situation, approaches, and existing model of medical cannabis use among the general public and network partners in Yangtalad District, Kalasin Province.
2) To develop a model for promoting health literacy on medical cannabis use among the general public and network partners in Yangtalad District, Kalasin Province.
3) To evaluate the effects of health literacy development on medical cannabis use among the general public and network partners in Yangtalad District, Kalasin Province.

Methods

This research and development study examined the development of health literacy for medical cannabis use in Yangtalad District, Kalasin

Province, from January 2023 to October 2025 (34 months). It comprised three phases: Phase 1, study of context and situation (months 1–3: January–March 2023); Phase 2, model development (months 4–6: April–June 2023); and Phase 3, evaluation, activity improvement, and lessons learned every three months (months 7–34: July 2023 – October 2025), as detailed below.

Population and Sample

Population included 109,028 residents of the 15 sub-districts of Yangtalad District during January 2023 – October 2025 (34 months), 722 network partners, and all patients who presented to the emergency department with cannabis-related conditions.

Sample The sample consisted of two parts. Part 1 was the sample for measuring health literacy before and after development. The sample size was calculated using the formula for estimating a proportion with a known population size,[16] yielding 469.78, rounded to 470 per group (940 in total): 1) 470 members of the general public and 2) 470 medical cannabis network partners. Part 2 comprised the groups involved in model development, namely community leaders, village health volunteers (VHVs), public representatives, heads of government agencies, public health personnel, community enterprises, and former drug-use groups under surveillance (details in Results). Sampling covered all 15 sub-districts, with households in each sub-district allocated proportionally by household size, followed by simple random sampling by lottery; one person was selected per household, and the next household was drawn if needed. Participants lost before the end of the project were replaced by the next participants on the list whose data had already been collected.

Inclusion criteria 1) Aged 15 years or older, resident in Yangtalad District for at least one year, able to communicate in Thai, and willing to participate; 2) network partners had worked in medical cannabis or health in the area for at least six months, including community leaders, VHVs, public health personnel, and community enterprise members.

Exclusion criteria Moving out of the area, loss to follow-up, withdrawal from the study, or incomplete interviews (replaced by the next person on the list whose data had already been collected).

Research Instruments

The research instruments comprised: 1) instruments for context study and model development, namely a problem-solving process for medical cannabis use and health literacy in the area, consisting of group interviews, group processes to gather and analyze problems, setting of measures, community forums, assignment of network partner roles, lessons learned on problems, obstacles, and solutions, and revision of measures, activities, and partner roles in line with the lessons learned; and 2) data collection instruments, namely 2.1) a medical cannabis use record form for health facilities and 2.2) a health literacy interview developed from a literature review and adapted from the Department of Health, Ministry of Public Health, covering seven domains of medical cannabis use: 1) knowledge and understanding, 2) access to information and services, 3) communication, 4)

self-management of health conditions, 5) media and information literacy, 6) decision-making on correct practices, and 7) self-care behavior. The total score for all seven domains was 45, interpreted at three levels: low (below 34.00), moderate (34.00–38.99), and high (39.00–45.00). Content validity (IOC) was examined by three lecturers from the Faculty of Health Sciences, Kalasin University, and reliability was tested with 30 participants in a neighboring district, yielding a Cronbach's alpha coefficient of 0.86.

Data Collection

Data were collected in two forms: secondary data copied from the records of Yangtalad Hospital, Kalasin Province, and primary data obtained from group activities and interviews. The procedures were as follows: letters requesting permission to collect data and participate in group activities were sent to heads of government and private agencies; letters were sent to communities requesting permission to collect data in the area; the situation, local problems, number of patients, symptoms, purposes of cannabis use, and health literacy before development were collected and analyzed (January–March 2023); the roles of network partners in problem-solving were defined (April 2023); measures, activities, and partner roles were implemented (April–June 2023); lessons learned on problems, obstacles, and solutions were summarized (July 2023); measures, activities, and partner roles were revised according to the lessons learned (August 2023); the revised measures were implemented with lessons learned every three months (September 2023 – June 2025); emergency department data were collected and health literacy was assessed after development (July–September 2025); and the final lessons learned were summarized (October 2025).

Data Analysis

Data from the interviews and record forms were tabulated and analyzed using R-studio. Descriptive statistics, including frequency distribution, percentage, arithmetic mean ($\bar{x}$), and standard deviation (S.D.), were used to describe sex, age, marital status, education level, and income. Inferential statistics were tested at a significance level of .05: paired t-test to compare scores before and after development, independent t-test to compare scores between the general public and network partners, and chi-square test to compare the proportions of emergency department patients before and after development. Data from in-depth interviews and group meetings were analyzed using content analysis.

Research Ethics

This study was conducted with consideration for human research ethics of the Kalasin Provincial Public Health Office, with continuous attention to privacy, confidentiality, and informed consent. The researcher explained the objectives and procedures to participants before data collection and obtained signed informed consent. Emergency department data were de-identified, and participants could withdraw from the study at any time without affecting their access to services.

Results

1. Situation, approaches, and existing model of medical cannabis use among the general public and network partners

1.1 General characteristics of the sample The 470 members of the general public were mostly female (72.55%), aged 25 years or younger (52.77%; $\bar{X}$±S.D. = 28.14±8.10 years), and all were Buddhist (100%). Most were married (58.72%), had a primary school education (54.26%), worked in agriculture (77.87%), and had a family income below 10,000 baht (55.96%; $\bar{X}$±S.D. = 10,420.50±9,610.25 baht). Among the 470 medical cannabis network partners, most were female (70.43%) and aged 41–45 years (34.89%; $\bar{X}$±S.D. = 41.20±7.28 years), and all were Buddhist (100%); 79.15% were married, 35.96% held a bachelor's degree or higher, 38.94% were government employees, and 51.28% had a family income below 10,000 baht ($\bar{X}$±S.D. = 18,532.40±18,970.15 baht), as shown in Table 1.

1.2 Situation, problems, approaches, and existing model of medical cannabis use Before the development (January–March 2023), 286 patients presented to the emergency department of Yangtalad Hospital because of cannabis use. The largest group was aged 60 years or older (84 patients; 29.37%). The most common symptoms were dry mouth and throat (24.13%), palpitations (18.53%), and drowsiness (13.64%), respectively, followed by seizures (12.59%) and unsteady gait (11.54%). The main purpose of use was recreation (48.25%), followed by cooking (30.42%) and medical purposes (21.33%), respectively. The existing model emphasized passive services in public health facilities. Focus groups indicated that increasing cannabis use was associated with news trends, popularity in the community, online ordering, and changes in the law, while the public and network partners still lacked knowledge and confidence about correct use and legal requirements. Health literacy before the development was low ($\bar{X}$±S.D. = 32.95±2.72 points out of a possible 45).

2. Development of a model to promote health literacy for medical cannabis use

2.1 Process and target groups for model development The model development addressed seven domains of health literacy, with the following target groups: 1) community leaders from 15 villages (15 persons); 2) VHVs, 5 per village (75 persons); 3) public representatives, 10 per village from 15 villages (150 persons); 4) the Yangtalad District Chief Officer and heads of government agencies (22 persons); 5) the director of Yangtalad Hospital, the District Public Health Officer, and the persons responsible for medical cannabis services in the community hospital and sub-district health promoting hospitals (54 persons in total); 6) two community enterprise groups in Yangtalad District (106 persons); and 7) former drug-use groups requiring community surveillance (34 persons). Activities followed the steps shown in Table 2.

2.2 Model obtained from the development In the initial phase of development (April–June 2023), Yangtalad District found more patients using cannabis for recreation than for medical purposes, and severe symptoms such as seizures and unsteady gait began to appear more often. The model was therefore

adjusted by increasing surveillance of former drug-use groups and sending personnel and community members for training on medical cannabis use, emphasizing appropriate dosing and avoidance of use by people with allergies. After the measures were revised, the model comprised seven components: 1) joint situation analysis using the district health system approach; 2) a committee with assigned duties and responsible persons among the network partners; 3) a medical cannabis education and service clinic dispensing five cannabis formulations; 4) personnel development, sending physicians, pharmacists, nurses, Thai traditional medicine practitioners, sub-district health promoting hospital staff, VHVs, and community leaders for training to strengthen health literacy in medical cannabis use; 5) support for sub-district health promoting hospitals to promote health literacy in the community; 6) health literacy promotion through community enterprises, namely the Yangtalad Thai Herbal Plant Community Enterprise (growing, processing, and producing medicines), together with the hemp group, the Nong Tok Paen group, and a private group in Yangtalad Sub-district; and 7) surveillance of former drug-use groups through the community and network partners. When the law changed in June 2025, the committee adjusted its publicity and training to comply with the new notification controlling cannabis inflorescences for use under a physician's prescription.

3. Effects of health literacy development on medical cannabis use

3.1 Comparison of health literacy before and after the development Health literacy scores of the 940 members of the general public and network partners differed significantly in every domain before and after the continuous development, in both the general public and the network partners ($p<0.001$). The total score across the seven domains for both groups combined increased from a low level (32.95±2.72 points) to a moderate level (37.74±2.51 points) ($t = 41.25$, 95%CI = 4.56–5.02, $p<0.001$). The general public increased from 32.35±2.71 to 37.70±2.54 points, and the network partners from 33.55±2.60 to 37.78±2.47 points. The domain with the greatest increase in both groups was self-care behavior ($t = 18.43$ and 17.12, respectively), as shown in Table 3.

3.2 Comparison of health literacy between the general public and network partners Before the development, the network partners had a significantly higher total health literacy score than the general public (33.55 and 32.35 points; $t = -6.93$, $p<0.001$). After the development, however, the scores were 37.70 points for the general public and 37.78 points for the network partners, which did not differ ($t = -0.49$, $p = 0.625$), as shown in Table 4.

3.3 Emergency department patients with cannabis-related conditions before and after the development After the continuous development (July–September 2025), 149 patients presented to the emergency department, down from 286 (a decrease of 47.90%). The largest group was again aged 60 years or older (43 patients; 28.86%). The most common symptoms were dry mouth and throat (26.85%), palpitations (20.13%), and drowsiness (16.11%), respectively. Indicators of severity decreased: seizures fell from 12.59% to 5.37% ($\chi^2 = 5.61$, $p = 0.018$), while unsteady gait fell from

11.54% to 7.38%, which was not statistically significant (χ^2 = 1.86, p = 0.173). The main purpose of cannabis use shifted from recreation (48.25% before the development) to cooking (42.28%) and medical purposes (38.26%), and the proportion using cannabis for recreation fell to 19.46%, a statistically significant change (χ^2 = 35.49, p<0.001), as shown in Table 5.

Table 1 Demographic characteristics of the general public and medical cannabis network partners

Demographic characteristic	General public (n = 470) n (%)	Medical cannabis network partners (n = 470) n (%)
Sex		
Male	129 (27.45)	139 (29.57)
Female	341 (72.55)	331 (70.43)
Age (years)		
25 years or younger	248 (52.77)	12 (2.55)
26-30 years	83 (17.66)	38 (8.09)
31-35 years	42 (8.94)	49 (10.43)
36-40 years	52 (11.06)	83 (17.66)
41-45 years	24 (5.11)	164 (34.89)
46 years or older	21 (4.47)	124 (26.38)
Marital status		
Single	181 (38.51)	71 (15.11)
Married and living together	276 (58.72)	372 (79.15)
Widowed/divorced/separated	13 (2.77)	27 (5.74)
Education level		
Primary school	255 (54.26)	118 (25.11)
Lower secondary school	142 (30.21)	74 (15.74)
Upper secondary school/Vocational certificate	53 (11.28)	109 (23.19)
Bachelor's degree or higher	20 (4.26)	169 (35.96)
Occupation		
Agriculture/farming	366 (77.87)	152 (32.34)
Government service/public sector	0 (0.00)	183 (38.94)
Trading/private business	20 (4.26)	87 (18.51)
General labor/student/other	84 (17.87)	48 (10.21)
Monthly family income (baht)		
Below 10,000	263 (55.96)	241 (51.28)

Demographic characteristic	General public (n = 470) n (%)	Medical cannabis network partners (n = 470) n (%)
10,000 or more	207 (44.04)	229 (48.72)

Table 2 Steps of model development, activities, tools, duration, and academic rationale (January 2023 – October 2025)

Phase/Month	Activities/Content	Tools used	Duration	Academic rationale
Jan–Mar 2023	Studied the context and analyzed the situation jointly using the district health system approach; collected emergency department patient data; assessed health literacy before the development	Emergency department case record form, health literacy interview, focus groups	3 months	Used empirical data to define problems and as the baseline for before–after comparison
Apr 2023	Established a committee, assigned duties, and defined network partner roles	Group processes, community forums	1 month	Principle of community and network participation for sustainability
Apr–Jun 2023	Implemented the measures: set up the medical cannabis education and service clinic (five formulations), trained personnel, and supported sub-district health promoting hospitals and community enterprises	Educational media, training, user manual	3 months	Developed the seven health literacy domains based on the Department of Health concept
Jul 2023	Lessons learned on problems, obstacles, and solutions	Lessons-learned group process	1 month	Action learning to improve the measures
Aug 2023	Revised the measures, adding surveillance of former drug-use groups and training in emergency management of cannabis-related conditions	Community forums, group processes	1 month	Responded to the severe symptoms observed, such as seizures and unsteady gait
Sep 2023 – Jun 2025	Implemented the revised measures, monitored results, and drew lessons learned every 3 months	Case record form, group meetings	22 months	Continuous improvement (PDCA) in line with changing contexts and laws

Phase/Month	Activities/Content	Tools used	Duration	Academic rationale
Jul–Sep 2025	Post-development evaluation: collected emergency department patient data and measured health literacy	Case record form, health literacy interview	3 months	Systematic before–after comparison of results
Oct 2025	Summarized the final lessons learned and the model	Group processes, in-depth interviews	1 month	Verified the model qualitatively against the quantitative results

Table 3 Comparison of mean health literacy scores for medical cannabis use before and after the development, by group (Paired t-test)

Variable	Group	Before		After		t	p-value
		$\bar{x}$	S.D.	$\bar{x}$	S.D.		
1. Knowledge and understanding (full score 10)	General public	7.18	1.60	8.20	1.27	10.79	<0.001*
	Network partners	7.48	1.52	8.22	1.23	8.23	<0.001*
2. Access to information and services (full score 5)	General public	3.55	0.92	4.17	0.69	11.69	<0.001*
	Network partners	3.70	0.88	4.18	0.67	9.46	<0.001*
3. Communication (full score 5)	General public	4.42	0.84	4.93	0.79	11.06	<0.001*
	Network partners	4.54	0.80	4.93	0.77	8.90	<0.001*
4. Self-management of health conditions (full score 5)	General public	3.40	0.94	4.04	0.85	11.56	<0.001*
	Network partners	3.55	0.90	4.07	0.83	9.80	<0.001*
5. Media and information literacy (full score 5)	General public	3.75	1.05	4.22	0.78	7.84	<0.001*
	Network partners	3.89	1.00	4.21	0.76	5.55	<0.001*
6. Decision-making on correct practices (full score 5)	General public	2.98	0.86	3.37	0.67	8.05	<0.001*
	Network partners	3.10	0.82	3.38	0.65	6.07	<0.001*
7. Self-care behavior (full score 10)	General public	7.07	1.56	8.77	0.82	18.43	<0.001*
	Network partners	7.29	1.50	8.79	0.78	17.12	<0.001*
Total score, 7 domains (full score 45)	**General public**	**32.35**	**2.71**	**37.70**	**2.54**	**32.04**	**<0.001***
	Network partners	**33.55**	**2.60**	**37.78**	**2.47**	**26.20**	**<0.001***

Note: *Statistically significant at p-value <.05

Table 4 Comparison of mean health literacy scores for medical cannabis use between the general public and network partners, before and after the development (Independent t-test)

Variable	General public (n = 470)		Network partners (n = 470)		t	p-value
	$\bar{x}$	S.D.	$\bar{x}$	S.D.		
Overall health literacy before the development (full score 45)	32.35	2.71	33.55	2.60	-6.93	<0.001*
Overall health literacy after the development (full score 45)	37.70	2.54	37.78	2.47	-0.49	0.625
Knowledge and understanding domain before the development (full score 10)	7.18	1.60	7.48	1.52	-2.95	0.003*
Knowledge and understanding domain after the development (full score 10)	8.20	1.27	8.22	1.23	-0.25	0.806

Note: *Statistically significant at p-value <.05

Table 5 Comparison of cannabis use purposes and severe symptoms among emergency department patients before and after the development (Chi-square test)

Variable	Before the development (N = 286) n (%)	After the development (N = 149) n (%)	χ^2	p-value
Purpose: cooking	87 (30.42)	63 (42.28)	35.49	<0.001*
Purpose: recreation	138 (48.25)	29 (19.46)		
Purpose: medical	61 (21.33)	57 (38.26)		
Seizures	36 (12.59)	8 (5.37)	5.61	0.018*
Unsteady gait	33 (11.54)	11 (7.38)	1.86	0.173

Note: *Statistically significant at p-value <.05

Discussion

The results showed that before the development (January–March 2023), most emergency department patients used cannabis for recreation (48.25%) rather than for medical purposes (21.33%), and public health literacy was low. The number of cannabis-related patients tended to rise at first because of news trends, popularity in communities, online ordering, government policy, and the announcement or amendment of important laws. Development was difficult in the initial phase: strategies had to be adjusted, the public had to

be informed of the dangers of incorrect medical use or overdose, and psychiatric patients with former substance use had to be monitored, after which the number of patients could be reduced. This is consistent with Worathanarat, whose final report on a medical cannabis policy case study identified key problems to be addressed, namely knowledge and understanding, medical beliefs, effects on medical treatment, fake news and misleading advertising, the expansion of the cannabis business, difficulties in building knowledge about cannabis, and social problems arising from the medical cannabis policy.[17]

Indicators of severity, such as seizures and unsteady gait, observed in the early phase showed that cannabis was being used in the community in increasing amounts and without adequate knowledge of its use, or possibly mixed with other substances and obtained easily. The researcher therefore adjusted the measures by publicizing information in the community, monitoring former substance-use groups and previously ill patients to prevent recurrence, and advising that cannabis be used appropriately for sex, age, or body weight and avoided by people with allergies. These measures reduced the severe symptoms, with seizures decreasing significantly. This is consistent with Panwichian, who studied factors associated with medical cannabis use behavior and found that personal characteristics, patterns of use, and perceived advantages and disadvantages of medical cannabis were related to the public's medical cannabis use behavior.[18] The seven-component model can be sustained only if the community is placed at the center and participates in building health literacy. This is consistent with Jomsri et al., who developed a program to enhance correct health literacy on medical cannabis use among people in Chiang Rai Province and found that the program increased health literacy and that continuous information from relevant agencies was important to its success.[19]

The purpose of cannabis use shifted from recreation to cooking and medical purposes after the development. The patients presenting to the emergency department were mostly recreational users rather than medical users, and the relaxation of the law for medical use worked in this group's favor. Although the model in Yangtalad District was implemented seriously, the proportion of medical use after the development rose to only 38.26%, still slightly below cooking use (42.28%). Only public health facilities encouraged use in patients, and the public itself still used cannabis little for medical purposes, possibly because of fear and lack of knowledge. Development should therefore focus on promoting health literacy for medical cannabis use. This is consistent with Sihakhom and Sihakhom, who studied knowledge and attitudes toward medical cannabis use among pharmacists in community hospitals in Sakon Nakhon Province and found moderate knowledge and attitudes; sex and training experience affected knowledge, while sex, age, work experience, and training experience affected attitudes. Training activities on medical cannabis use should therefore be provided for both the public and personnel.[20]

The model-based development significantly increased health literacy. Because the Yangtalad model used network partners and the community as the main driving mechanism, it succeeded readily, although it took a long time,

measured in years. In the early phase, legal problems arose and network partner personnel lacked confidence, so they were sent for additional training on medical cannabis use and relevant laws. This is consistent with Onklai and Suwanphan, who studied health literacy on medical cannabis use among village health volunteers in Khon Kaen Province and found that most had moderate literacy in each domain, and that relevant agencies should develop this literacy, especially among VHVs whose level was still low, including those with misconceptions, such as using cannabis to relieve asthma.[21] In addition, before the development the network partners scored higher than the general public, but after the development the scores of the two groups did not differ (37.70 and 37.78 points), indicating that promotion through network partners and the community brought the public's health literacy close to that of those who work directly in this field.

Limitations of the study This research and development study had no control group, so causal relationships cannot be clearly concluded. The findings may have been influenced by external factors, particularly the June 2025 legal change that restricted cannabis inflorescences to medical use under a physician's prescription, which took effect before the post-development data collection period (July–September 2025). In addition, the emergency department data came from a single hospital, and health literacy was measured by interview, which may be subject to social desirability bias.

Conclusion

The development of health literacy for medical cannabis use in Yangtalad District, Kalasin Province, between January 2023 and October 2025 produced a seven-component model that uses network partners and the community as the main mechanism. After the development, emergency department visits decreased from 286 to 149 patients, seizures decreased significantly, the purpose of use shifted from recreation to cooking and medical purposes, and the health literacy of the public and network partners increased significantly from a low to a moderate level ($p<0.001$). After the development, the scores of the general public did not differ from those of the network partners.

Recommendations

1. Recommendations for applying the findings Districts with similar contexts can adopt this model, but should monitor former drug-use groups, promote training in managing cannabis-related medical emergencies, promote health literacy among network partners and the public, and keep communication up to date with legal changes, namely the Notification on Controlled Herbs (Cannabis) B.E. 2568 (2025).

2. Recommendations for future research Future studies should include a comparison group in areas that did not receive the model, follow up over the long term after legal changes, and also examine the clinical outcomes and safety of medical cannabis users.

Acknowledgments

This research was completed with the kind assistance of Dr. Apichai Limanon, Kalasin Provincial Chief Medical Officer, and the Yangtalad District Chief Officer, who facilitated data collection in the area. We also thank the public and the network partners of Yangtalad District for their cooperation in the interviews and group activities.

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