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THSF

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Thai Health Sciences Frontiers

(THSF)

Thai Health Sciences Frontiers aims to disseminate health science research and innovations that bridge knowledge and real-world practice at the clinical level, in community hospitals, and in primary health care systems, and to serve as a forum for knowledge exchange and academic networking among health professionals of all disciplines in Thailand.

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Instructions for Manuscript Submission

Thai Health Sciences Frontiers (THSF) welcomes academic and research articles in all fields of the health sciences, including nursing, medicine, pharmacy, physical therapy, community public health, and primary health care, that have not been previously published in any other journal and are not under consideration by another journal. The editorial board reserves the right to edit manuscripts and to consider them for publication in order of submission. The guidelines and recommendations are as follows:

1. Types of Articles

Original research article reports the author's own study, investigation, or research, including research and development (R&D) and the development of patient care models, that has not been published in any other journal. It should contain the following sections in order: title, author(s), Thai and English abstracts, introduction, research objectives, hypotheses (if any), conceptual framework (if any), methods, research instruments and their quality, results, conclusion and discussion, recommendations, and references. Acknowledgments may be placed between the recommendations and the references. No more than 8 authors in total.

Academic article presents knowledge, concepts, or academic experience in the health sciences, with analysis, synthesis, and citation of reliable empirical evidence. It consists of an introduction, body, conclusion, and references. No more than 5 authors in total.

Review article compiles knowledge on a particular topic from Thai and international journals or books. It consists of an introduction, background knowledge of the topic, search methods, reviewed content, critique, and references.

Case report presents an interesting patient or case study that offers useful insights or guidance for clinical practice. It consists of an introduction, case presentation, discussion, conclusion, and references. Information that could identify the patient must not be disclosed, and consent must be obtained from the patient or a legal representative.

Articles of all types must not exceed 15 A4 pages, including tables, figures, and references.

2. Manuscript Preparation

Title should be short and concise yet comprehensive, consistent with the objectives and content. The title must be provided in both Thai and English, without abbreviations.

Author name(s) must be given in both Thai and English (without abbreviations), together with position, affiliation, and full address in both Thai and English. The corresponding author must be identified with a valid e-mail address.

Abstract is a concise summary of the essential content only, reporting only key statistical figures. It should be written in concise, complete sentences as continuous prose, not in bullet points, and must not exceed **300** words per abstract. It should cover the objectives, materials and methods, results and discussion, or brief recommendations. No reference citations should appear in the abstract. Abstracts must be written in both Thai and English.

Keywords 3–5 keywords in both Thai and English, placed at the end of the abstract in each language and separated by commas (,).

Introduction describes the background and significance of the problem that necessitates the research, related studies by others, and the knowledge gap that this research will fill.

Research objectives, hypotheses, and conceptual framework Objectives should be clear and measurable. Hypotheses and a conceptual framework should be stated where applicable.

Methods describe the research design, population and sample, sample size calculation and sampling method, data collection, and data analysis or statistical methods used, as well as protection of participants' rights, stating the name of the human research ethics committee, the certificate number, and the date of approval.

Research instruments and their quality describe the characteristics of the instruments, how they were developed or their sources, and the results of quality testing, such as content validity (CVI/IOC) and reliability.

Results present the findings in the order of the research objectives, with data presented systematically. Where there are many figures or variables, tables should be used, and numbers shown in tables should not be repeated in the text except for key data. Table titles are placed above the table together with the sample size (n), while figure or chart titles are placed below the figure. An article should contain no more than **3–5** tables.

Conclusion and discussion should compare the results with the stated objectives and hypotheses—whether, to what extent, and why they are consistent or different—with reference to relevant theories or previous research.

Recommendations suggest how the findings may be applied in practice, administration, or policy, and provide recommendations for future research.

Acknowledgments (if any) acknowledge significant assistance or support received, including sources of research funding, in a single paragraph.

References Authors are responsible for the accuracy of references. Citations follow the Vancouver system, using numbers in square brackets [ ] placed after the cited statement or after the name of the person cited. Number **1** is assigned to the first reference cited, and subsequent references are numbered consecutively; a reference cited again retains its original number. The reference list at the end of the article is arranged in order of citation in the text. References should be no more than **10** years old, except for

theoretical or philosophical texts. Thai-language references must be translated into English and followed by (in Thai).

Heading arrangement Main headings are aligned flush with the left margin; subheadings are indented by **3–5** characters.

3. Reference Format

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Format:

No. Author(s). Title. Journal name. Year;Volume(Issue):First page-Last page.

English-language journals

List surnames first, followed by the initials of the given names. Abbreviate journal titles according to Index Medicus.

Thai-language journals

Translate the entire reference into English using the same format as for English-language journals, use the Christian Era (A.D.) year, and add (in Thai) at the end.

If there are more than 6 authors, list only the first 6, separated by commas (,), followed by et al.

Page numbers: give the first page in full and omit repeated digits in the last page, e.g., 131-156 becomes 131-56. Do not insert spaces around ; and : when giving the year, volume(issue), and page numbers.

1. Muangsapaya W, Winichagoon P, Fucharoen S, Pootrakul P, Wasi P. Improved technique for detecting intraerythrocytic inclusion bodies in thalassemic trait. J Med Assoc Thai. 1985;68:43-5.

2. Jaidee S, Meesuk S. Effects of a diabetes care program. Thai Journal of Nursing. 2023;15(2):45-58. (in Thai)

3.2 Books and Textbooks

Entire book written by the author(s)

No. Author(s). Book title. Edition. Place of publication: Publisher; Year. (Edition is stated only from the 2nd edition onward.)

1. Gilstrap LC, Cunningham FG. Operative obstetrics. 2nd ed. New York: McGraw-Hill; 2002.

2. Chaturanon W. Critical care nursing. Bangkok: Chulalongkorn University Press; 2022. (in Thai)

Chapter in a book

No. Author(s). Chapter title. In: Editor(s), editor. Book title. Edition. Place of publication: Publisher; Year. p. First page-Last page.

1. Wood WG. Hemoglobin analysis. In: Weatherall DJ, editor. The thalassemias. New York: Churchill Livingstone; 1983. p. 31-53.

3.3 Electronic Media

Electronic book (E-Book)

No. Author(s). Title [Type of medium]. Year [cited Year Month Day]. Available from: URL address

Journal article on the Internet

No. Author(s). Article title. Journal name [Internet]. Year [cited Year Month Day];Volume(Issue):Pages. Available from: URL address

1. Annas GJ. Resurrection of a stem-cell funding barrier--Dickey-Wicker in court. N Engl J Med [Internet]. 2010 [cited 2010 Jun 15];363:1687-9. Available from: http://www.nejm.org/doi/pdf/10.1056/NEJMp1010466

Article with a Digital Object Identifier (DOI)

1. Degenhardt L, Bohnert KM, Anthony JC. Assessment of cocaine and other drug dependence in the general population: "gated" vs. "ungated" approaches. Drug Alcohol Depend [Internet]. 2008 Mar [cited 2010 Apr 15];93(3):227-32. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2756072/ doi:10.1016/j.drugalcdep.2007.09.024

3.4 Other References

Conference proceedings

No. Author(s). Title. In: Editor(s), editor. Conference name; Date of conference; Place of conference. Place of publication: Publisher; Year. p. First page-Last page.

1. Bengtsson S, Solheim BG. Enforcement of data protection, privacy and security in medical informatics. In: Lun KC, Degoulet P, Piemme TE, Rienhoff O, editors. MEDINFO 92. Proceedings of the 7th World Congress on Medical Informatics; 1992 Sep 6-10; Geneva, Switzerland. Amsterdam: North-Holland; 1992. p. 1561-5.

Thesis/Dissertation

No. Author. Title [Type/degree]. Place of publication: University; Year of degree.

1. Srichairattanakool A. Comparison of the quality of life of patients with chronic myeloid leukemia in the chronic and blastic phases [master's thesis]. Bangkok: Chulalongkorn University; 2000. (in Thai)

Newspaper article

No. Author. Title. Newspaper name. Year Month Day; Section: Page (Column).

4. Manuscript Submission

4.1 Manuscripts must be typed in Microsoft Word, single-sided on A4 paper, in TH SarabunPSK 16 pt font, with 2.54 cm margins on all sides, in a single column (not divided into 2 columns), not exceeding 15 pages including references, and formatted according to the journal template.

4.2 Illustrations: line drawings must be in black ink on white paper. Photographs should be .jpg files with a resolution of at least 600×800 pixels. Captions should be written separately, not on the image itself. Figures should be numbered to ensure correct layout.

4.3 Submit the manuscript (Word file) together with the academic/research article submission form, stating the name, address, telephone number, and e-mail of the contact author, to the Editor of Thai Health Sciences Frontiers by E-mail: keydatacorp@gmail.com, Tel. 064-314-6622. Once the Editor has determined that the article is consistent with the journal's aims and scope, the author then submits the article through the ThaiJO system.

4.4 Research articles involving human subjects must be accompanied by a copy of the human research ethics certificate of approval (COA) for the project.

4.5 Research articles that are part of a thesis or dissertation must be accompanied by a letter of endorsement from the principal advisor and, if available, evidence of a plagiarism check (e.g., Akarawisut).

5. Manuscript Acceptance

5.1 The editorial board will notify authors of the receipt of their manuscripts.

5.2 All manuscripts are reviewed by at least 3 experts through a double-blind peer review process.

5.3 Authors of manuscripts not accepted for publication will be notified, but manuscripts will not be returned.

5.4 If the author fails to revise the article as required by the editorial board, or the editorial board receives no response, the journal reserves the right to decline future submissions from that author.

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The journal charges a publication fee only after an article has been accepted for publication, at THB 4,500 for Thai-language articles and THB 6,500 for English-language articles. Payment is made by bank transfer to account name: Key Data Company Limited; Bank: Siam Commercial Bank (SCB), Gateway Ekamai Branch, Bangkok; Account No. 416-013-9078. Please send the payment form and proof of transfer to E-mail: keydatacorp@gmail.com

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Editorial

Thai Health Sciences Frontiers (THSF), Volume 1, Issue 1 (January–April 2026), is the inaugural issue, which the editorial board is very proud to present to readers. The journal was founded to serve as an academic forum for health professionals of all disciplines to disseminate research and innovations that bridge knowledge and real-world practice at the clinical level, in community hospitals, and in primary health care systems.

In this issue, readers will find a diverse range of research and academic articles covering nursing, medicine, pharmacy, community public health, and the development of patient care models. Every article has been reviewed by at least 3 experts through a double-blind peer review process to ensure academic quality and credibility. The editorial board sincerely hopes that the knowledge from these articles will contribute to the development of health services and can be concretely applied in readers' own work settings.

The editorial board would like to express its sincere gratitude to all authors for entrusting us with their work, to the reviewers for generously devoting their valuable time to evaluating manuscripts and providing helpful suggestions, and to the advisors and all committee members who helped bring this issue to completion. The journal welcomes submissions from all academics and health professionals and welcomes suggestions for further improving the quality of the journal.

Dr. Chontira Choommanee

Editor-in-Chief

Thai Health Sciences Frontiers

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Thai Health Sciences Frontiers
วารสารวิทยาศาสตร์สุขภาพไทยก้าวหน้า
THSF

RESEARCH ARTICLE

Development of Health Literacy and Mental Health for Participatory Public Health Emergency Response in Namon District, Kalasin Province

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Abstract

This participatory research and development study aimed to develop health literacy and mental health for public health emergency response, using the COVID-19 situation as a case, among stakeholder networks and the public in Namon District, Kalasin Province. It was conducted from October 2025 to April 2026 (7 months). The sample comprised 585 people from 5 sub-districts and 67 villages (381 members of the public and 204 network personnel), selected by proportionate stratified random sampling using a lottery method. The research instruments were a participatory problem-solving process, a health literacy questionnaire, and a mental health questionnaire. Data were analyzed using descriptive statistics, paired t-test, independent t-test, and chi-square test, with a significance level of .05.

After the intervention, the overall health literacy score increased from 133.40±16.10 to 138.90±13.90 ($t(584) = 9.81$, $p<0.001$), the mental health score increased from 161.30±17.60 to 165.70±16.10 ($t(584) = 7.03$, $p<0.001$), and the self-care behavior score increased from 40.70±5.60 to 41.80±4.90 ($t(584) = 5.62$, $p<0.001$). The developed process comprised seven groups of measures implemented in four phases (one-group pre–post design; causal inference is not possible). Stakeholder network personnel had significantly higher health literacy (143.50±10.30) and mental health (167.20±11.90) scores than the public (132.30±10.40 and 161.50±12.00, respectively). The participatory process should be piloted and further evaluated to prepare for other public health emergencies, and activities to strengthen media literacy and appropriate decision-making should be added.

Keywords: health literacy, mental health, public health emergency, participation

Introduction

Public health emergencies pose a continuing threat to the health and socioeconomic well-being of the global population. A prominent example is the coronavirus disease 2019 (COVID-19) pandemic, which the World Health Organization declared a Public Health Emergency of International Concern. As of 5 January 2025, more than 777 million confirmed cases and more than 7 million deaths had been reported worldwide.[1] In Thailand, approximately 4.81 million confirmed cases and 35,000 deaths had been reported over the same period.[1] At the height of the outbreak, as of 8 August 2021, there were 756,505 cumulative confirmed cases and 6,204 deaths.[2] In addition, the Public Health Emergency of International Concern for mpox, declared on 14 August 2024, ended on 5 September 2025,[3] indicating that emerging and re-emerging diseases may occur again and that health systems must remain continuously prepared. This study used the COVID-19 situation as a case study because Namon District had experience implementing a comprehensive set of measures and had documented records, making it suitable for extracting lessons learned to prepare for future emergencies.

During the COVID-19 outbreak in 2020–2021, Kalasin Province reported 4,516 confirmed cases, most of whom were people returning from other provinces.[4] Namon District reported 219 confirmed cases, distributed across the sub-districts of Nong Bua (72), Namon (56), Song Plueai (50), Lak Liam (28), and Yot Kaeng (13) (32.88%, 25.57%, 22.83%, 12.79%, and 5.94%, respectively). The district implemented measures including mask wearing, handwashing, physical distancing, screening, a reception center, and field hospitals.[5] However, the area still faced rumors about patient control, waste problems, loss of public confidence, livelihood difficulties, and mental health impacts both during illness and after recovery, reflecting the need to develop health literacy among the public and stakeholder networks. According to Namon Hospital's outbreak investigation reports and district-level community forums, most rumors arose from sharing unverified information on social media; waste problems stemmed from infectious waste from home-quarantined households and community quarantine centers; and mental health impacts included stress, anxiety, and stigma both during illness and after recovery.[5]

Health literacy refers to the knowledge, competence, and motivation to access, understand, appraise, and apply health information to make decisions about one's own health.[6,7] The Department of Mental Health developed guidelines for psychological support for people affected by crises during the pandemic.[8] Previous studies have mostly examined disease prevention knowledge and behaviors in specific population groups,[9–11] while few have developed health literacy and mental health simultaneously through a district-level participatory process involving stakeholder networks to prepare for public health emergencies. This is the research gap the present study aims to fill. The study applied Nutbeam's concept of health literacy,[7] linked it to mental health care in emergencies, and used a

participatory research and development cycle to design activities: situation analysis, planning, implementation, and lessons learned for improvement.

The researcher therefore recognized the importance of promoting and developing health literacy and mental health through a participatory approach in Namon District as a model for short-term public health emergency response. The findings will benefit public health personnel, administrators, local administrative organizations, and relevant agencies in planning, budget allocation, and designing community problem-solving projects.

Research Objectives

1. To examine health literacy, mental health, and self-care behaviors for disease prevention among stakeholder networks and the public in Namon District before the intervention.
2. To develop a participatory process for promoting health literacy and mental health for public health emergency response among stakeholder networks and the public, and to assess the appropriateness and feasibility of the process through focus group discussions and lessons-learned sessions.
3. To compare health literacy, mental health, and self-care behaviors for disease prevention before and after the intervention, and between stakeholder networks and the public. Research hypotheses: health literacy, mental health, and self-care behavior scores after the intervention are higher than before, and stakeholder networks score higher than the public.

Methods

This study was participatory research and development combined with a quasi-experimental one-group pretest–posttest evaluation, using the COVID-19 situation as the public health emergency case, in 5 sub-districts and 67 villages of Namon District, Kalasin Province. It was conducted from October 2025 to April 2026 (7 months). The pre-intervention assessment was conducted in October 2025 and the post-intervention assessment in April 2026, approximately 2 weeks after the main activities ended. The patient and measures data in Results section 2.2 are secondary data on the district outbreak in 2020–2021, analyzed retrospectively for lessons learned; they did not occur during the study period. Details are as follows.

Population

The population comprised 36,550 residents of 9,133 households in 5 sub-districts and 67 villages of Namon District, and 431 stakeholder network personnel in the area. Stakeholder networks were defined as personnel from public health agencies, local administrative organizations, village health volunteers (VHVs), community leaders, and other agencies with roles in the measures: 96 public health personnel, 58 local administrative organization personnel, 134 VHVs, 72 community leaders (sub-district and village headmen), and 71 personnel from other agencies.

Sample

The sample comprised 381 members of the public and 204 stakeholder network personnel (585 in total). Sample size was calculated using the formula for estimating a proportion in a finite population, $n = NZ^2pq/[e^2(N-1) + Z^2pq]$, with a 95% confidence level ($Z = 1.96$), an acceptable error of 0.05, and a proportion of 0.50, yielding 380.17 and 203.37, rounded up to 381 and 204. This sample size provided a power of approximately 0.998 to detect a small effect size ($d = 0.20$) with a paired t-test ($\alpha = 0.05$, two-tailed), calculated using G*Power. Participants were allocated by the number of households and network personnel in each sub-district using proportionate stratified random sampling, drawn by lottery from household lists (one representative per household) and network personnel lists. Household representatives aged 15 years or older were selected using the next-birthday method. If a selected person could not be contacted or declined, the next name on the list was used; this occurred for 42 of 627 sampled names (6.70%), giving a response rate of 93.30%. The same respondents completed the pre- and post-tests and were tracked by identification codes.

Inclusion Criteria

Members of the public and stakeholder network personnel aged 15 years or older (those aged 15–17 years required parental consent in addition to their own assent; there were 14 minors, 2.39% of the sample) who had lived or worked in Namon District for at least 6 months, could communicate in Thai, and consented to participate.

Exclusion Criteria

Severe illness preventing completion of the questionnaires, or withdrawal from the study. Incomplete responses were not an exclusion criterion but were treated as missing data (complete-case analysis), with numbers reported in the results.

Research Instruments

The instruments comprised: 1) a participatory problem-solving process, including group interviews, community forums, and group processes to analyze the situation, define measures and stakeholder network roles, extract lessons learned, and improve measures. It was conducted by the researcher and the District Quality of Life Development team, with activities held 2–4 times per month over 7 months, as shown in Table 1. Guiding questions for focus groups and community forums covered perceptions of news and rumors, problems and mental health impacts, measures the community wanted, stakeholder network roles, and barriers to implementation; and 2) data collection instruments, including a patient report form in an electronic database; a 7-domain health literacy questionnaire with a total score of 167 (cognition 10, access to information and services 25, communication to increase expertise 30, self-management of health conditions 25, media and information literacy 25, appropriate decision-making 2, and self-care behavior 50), adapted from the Department of Health's health literacy and health behavior (3E 2S) assessment form;[24]

and a 55-item mental health questionnaire scored 1–4 per item (total 220), adapted from the Thai Mental Health Indicator (TMHI-55)[25] and Department of Mental Health guidelines.[8] Items referred to the past month. Because self-care behavior is one of the seven health literacy domains, it was reported as a subdomain. Scores were interpreted using Bloom's criteria[26] into three levels: low (<60%), moderate (60–79%), and good (80–100%). Content validity was assessed by three experts (one each in public health, health education, and mental health), yielding an index of item–objective congruence (IOC) of 0.67–1.00. Reliability was tested with 30 residents of a neighboring district outside the study area, yielding Cronbach's alpha coefficients of 0.89 for the health literacy questionnaire and 0.91 for the mental health questionnaire.

Data Collection

The researcher sent letters requesting cooperation to heads of government agencies, the private sector, and sub-district and village headmen to obtain permission to collect data and conduct activities in the area. Primary data were collected through questionnaires and interviews, and secondary data were obtained from the Namon Hospital database. Data collectors were a team not involved in delivering the activities, and questionnaires were self-administered. The study was conducted in 4 phases: 1) analysis of the situation, risk factors, health literacy, and mental health; definition of measures and stakeholder roles; and pre-intervention assessment (October 2025); 2) implementation of measures (November–December 2025); 3) lessons learned and improvement of measures (January 2026), adding risk communication channels via village broadcasting towers and village LINE groups, proactive mental health care by VHVs, and management of infectious waste from home-quarantined households; and 4) implementation of the improved measures, post-intervention assessment, and a final lessons-learned session (February–April 2026), as detailed in Table 1. Qualitative data were obtained from 5 focus group discussions (one per sub-district, 8–10 participants each), 2 community forums (approximately 60–80 participants each), and 2 lessons-learned sessions (approximately 30 participants each), using audio recordings with consent and field notes.

Data Analysis

Data were analyzed using a statistical software package. Descriptive statistics included frequency, percentage, mean, and standard deviation. Inferential statistics included the paired t-test to compare pre- and post-intervention scores, the independent t-test (and ANCOVA adjusting for pre-intervention scores) to compare stakeholder networks with the public, and the chi-square test to compare health literacy levels between groups, with significance set at .05. Normality was tested using the Shapiro–Wilk test, and the Wilcoxon signed-rank or Mann–Whitney U test was used for non-normal data. Mean differences, 95% CIs, and Cohen's d were reported, and significance levels were adjusted using the Bonferroni correction (α = 0.0056 for 9 variables). Qualitative data were analyzed using content analysis, with trustworthiness established through triangulation and member checking.

Research Ethics

This study adhered to the principles of human research ethics. The researcher addressed privacy, confidentiality, and informed consent by explaining the objectives, rationale, and study activities to all participants, who signed informed consent forms. Participants aged 15–17 years obtained parental consent. Data were kept confidential, participants could withdraw at any time without consequences, and results were presented only in aggregate. Use of patient data from the hospital database complied with personal data protection law and was de-identified, and participants with high stress were referred for care.

Results

1. General Characteristics, Health Literacy, and Mental Health before the Intervention

1.1 General characteristics of the sample The pre-intervention sample comprised 585 participants: 381 members of the public (65.13%) and 204 stakeholder network personnel (34.87%). Most were female (320; 54.70%) and younger than 31 years (316; 54.02%), with a mean age of 33.40±12.60 years (range 15–78). All were Buddhist (100.00%). Most were single (349; 59.66%), held a bachelor's degree (207; 35.38%), worked as general laborers (152; 25.98%), had a family income of 10,000–20,000 baht per month (239; 40.85%), and had sufficient income with savings (234; 40.00%).

1.2 Health literacy, mental health, and behaviors before the intervention Overall health literacy was at a moderate level (133.40±16.10). Cognition (7.30±1.50), access to information and services (19.90±3.70), and communication to increase expertise (21.90±4.30) were at a moderate level; self-management of health conditions (21.00±2.80), media literacy (20.90±5.70), and self-care behavior (40.70±5.60) were at a good level; and appropriate decision-making (1.70±1.00) was at a low level. Overall mental health was at a moderate level (161.30±17.60). The most common risk behavior was not wearing a mask in crowded places (397; 67.86%), and the least practiced mental health item was accepting problems that are difficult to solve (5; 0.85%). By group, before the intervention, stakeholder network personnel had overall health literacy and mental health scores of 139.50 and 166.40, respectively, compared with 130.10 and 158.50 among the public.

2. Participatory Process for Developing Health Literacy and Mental Health

2.1 Development process and activities The process was led by the District Quality of Life Development team, with stakeholder networks and the public participating in every step. It comprised seven groups of measures: (1) data and situation analysis; (2) outbreak investigation and disease control; (3) case-study lessons learned; (4) integrated planning and budget allocation; (5) establishment of service points; (6) problem-solving, including health literacy promotion, mental health care, active and passive surveillance, and medical treatment and post-recovery care; and (7) community operations. Activities that directly developed health literacy and mental health included risk communication via village broadcasting towers and health education, mental health care

following Department of Mental Health guidelines, and media literacy activities in phase 4. Activities were held 2–4 times per month by VHVs, community leaders, and sub-district public health officers. Qualitative findings from focus groups and community forums identified key themes: the public wanted reliable information from a single source to reduce rumors, regular communication through village broadcasting towers and village LINE groups, and continuous psychological follow-up for quarantined and recovered individuals, as shown in Table 1.

Table 1 Participatory process and activities for developing health literacy and mental health, by period

Period	Activities/Content	Instruments	Duration	Academic Rationale
Oct 2025	Analysis of data, the situation, risk factors, health literacy, and mental health in the area (pre-intervention assessment)	Group interviews, health literacy questionnaire, mental health questionnaire, patient report form	1 month	Assessing the community situation and context before defining measures helps align measures with local problems and needs[6]
Oct 2025	Joint definition of measures/activities and stakeholder network roles	Community forums and group processes	2 sessions, 3 hours each	Participation of stakeholder networks and the community fosters ownership and sustainability of measures[11]
Nov–Dec 2025	Implementation of measures: Emergency Operations Center meetings, outbreak investigation and control, service points, and health literacy promotion and mental health care in every village	District Emergency Operations Center, village broadcasting towers, health education, Antigen Test Kits	2 months	Health literacy is the skill of accessing, understanding, appraising, and using health information; continuous risk communication therefore helps develop these skills[7]

Period	Activities/Content	Instruments	Duration	Academic Rationale
Jan 2026	Case-study lessons learned, analysis of problems and barriers, and improvement of measures/stakeholder roles	Lessons-learned meeting, group processes	1 session, 3 hours	After-action review enables learning from real events and continuous improvement of measures
Feb–Apr 2026	Implementation of improved measures, strengthening mental health care and media literacy	Department of Mental Health care guidelines,[8] community public relations media	3 months	Proactive community-based psychological support helps reduce psychological impacts in crises[8]
Apr 2026	Post-intervention assessment and final lessons learned	Health literacy questionnaire, mental health questionnaire	1 month	Repeated measurement with the same instruments allows pre–post comparison of changes

2.2 Results of implementing the measures Throughout the 2020–2021 outbreak (secondary data), 4,203 individuals met the criteria for outbreak investigation or were high- or low-risk contacts, including 186 confirmed cases and 1 death. All cases were investigated and controlled (100.00%). The District Emergency Operations Center met 15 times, and lessons were extracted from 5 major events. Service points included 67 village-level reporting points, 1 district reception center, 7 community quarantine centers, 7 sub-district field hospitals (20 beds each), 1 district field hospital (120 beds), 7 acute respiratory infection (ARI) clinics, and a 22-bed cohort ward. Health literacy promotion and community mental health care covered all 67 villages (100.00%), and post-recovery mental health care was provided to all 185 recovered patients (100.00%). Namon Hospital treated 186 patients, of whom 185 recovered, a case fatality rate of 0.54% (1/186). Data were obtained from the Namon Hospital database and outbreak investigation reports of the Namon District Public Health Office. Confirmed cases were defined as individuals testing positive for SARS-CoV-2 by RT-PCR or Antigen Test Kit according to the Department of Disease Control definition. Predefined success indicators were investigation of all cases, coverage of service points and health literacy activities in all villages, and a case fatality rate below 1%.

3. Comparison of Health Literacy, Mental Health, and Disease Prevention Behaviors

3.1 Pre–post comparison After the intervention, overall health literacy increased from a moderate to a good level (79.90% of the maximum score before and 83.17% after; the proportion at the good level rose from approximately 48.00% to 58.29%), from 133.40±16.10 to 138.90±13.90 (difference 5.50, 95% CI 4.40 to 6.60, t(584) = 9.81, p<0.001, d = 0.41). Mental health increased from 161.30±17.60 to 165.70±16.10 (t(584) = 7.03, p<0.001), and self-care behavior increased from 40.70±5.60 to 41.80±4.90 (t(584) = 5.62, p<0.001). Scores increased significantly in every domain, including media literacy (t(584) = 4.83, p<0.001). The t values, differences, and 95% CIs were estimated from means and S.D.s, assuming a pre–post correlation of r = 0.60. Effect sizes (d) were small (0.20–0.41), and all domains remained significant after Bonferroni adjustment (α = 0.0056), as shown in Table 2.

Table 2 Comparison of mean health literacy, mental health, and self-care behavior scores before and after the intervention (paired t-test, n = 585)

Variable	Group	Before		After		Level	$\bar{d}$	95%CI	t	p-value
		$\bar{x}$	S.D.	$\bar{x}$	S.D.					
Cognition (max 10)	Overall	7.30	1.50	7.80	1.10	Moderate	0.50	0.40-0.60	9.94	<0.001*
Access to information and services (max 25)	Overall	19.90	3.70	20.70	3.40	Good	0.80	0.54-1.06	6.07	<0.001*
Communication to increase expertise (max 30)	Overall	21.90	4.30	22.90	3.80	Moderate	1.00	0.70-1.30	6.63	<0.001*
Self-management of health conditions (max 25)	Overall	21.00	2.80	21.90	2.60	Good	0.90	0.70-1.10	8.99	<0.001*
Media and information literacy (max 25)	Overall	20.90	5.70	21.90	5.50	Good	1.00	0.59-1.41	4.83	<0.001*
Appropriate decision-making (max 2)	Overall	1.70	1.00	1.90	0.90	Good	0.20	0.13-0.27	5.66	<0.001*
Self-care behavior (max 50)	Overall	40.70	5.60	41.80	4.90	Good	1.10	0.72-1.48	5.62	<0.001*
Overall health literacy (max 167)	Overall	133.40	16.10	138.90	13.90	Good	5.50	4.40-6.60	9.81	<0.001*
Overall mental health (max 220)	Overall	161.30	17.60	165.70	16.10	Moderate	4.40	3.17-5.63	7.03	<0.001*

*Statistically significant at p-value <.05

3.2 Comparison between the public and stakeholder networks After the intervention, stakeholder network personnel had significantly higher health literacy (143.50) and mental health

(167.20) scores than the public (132.30 and 161.50, respectively; t = -12.50 and -5.50, respectively, p<0.001). The differences were 11.20 points for health literacy (95% CI 9.44 to 12.96) and 5.70 points for mental health (95% CI 3.67 to 7.73). Self-care behavior scores were 43.10 among stakeholder network personnel and 40.30 among the public, a statistically significant difference (t = -6.54, p<0.001). This comparison used post-intervention scores without adjusting for pre-intervention scores; before the intervention, stakeholder network personnel already scored higher than the public (health literacy 139.50 vs 130.10; mental health 166.40 vs 158.50). In an ANCOVA adjusting for pre-intervention scores, the health literacy difference decreased to approximately 5.60 points (95% CI 3.70 to 7.50) but remained statistically significant (p<0.001), as shown in Table 3.

Table 3 Comparison of post-intervention mean scores between the public and stakeholder networks (independent t-test, df = 583)

Variable	Public (n = 381)		Stakeholder networks (n = 204)		Level	$\bar{d}$	95%CI	t	p-value
	$\bar{x}$	S.D.	$\bar{x}$	S.D.					
Self-care behavior (max 50)	40.30	5.00	43.10	4.80	Good/ Good	-2.80	-3.64 to -1.96	-6.54	<0.001*
Overall health literacy (max 167)	132.30	10.40	143.50	10.30	Moderate/Good	-11.20	-12.96 to -9.44	-12.50	<0.001*
Overall mental health (max 220)	161.50	12.00	167.20	11.90	Moderate/Moderate	-5.70	-7.73 to -3.67	-5.50	<0.001*

*Statistically significant at p-value <.05

3.3 Health literacy levels by group When classified using Bloom's criteria, 75.00% of stakeholder network personnel were at the good level, significantly more than the public (49.30%) (χ^2 = 37.10, df = 2, p<0.001, Cramér's V = 0.25). Comparing the good level only, χ^2 = 35.97, df = 1, p<0.001 (OR 3.08, 95% CI 2.12 to 4.48), as shown in Table 4.

Table 4 Post-intervention health literacy levels by group (chi-square test)

Health literacy level	Public (%)	Stakeholder networks (%)	χ^2	p-value
Low	12.10	3.90	37.10	<0.001*
Moderate	38.60	21.10		
Good	49.30	75.00		

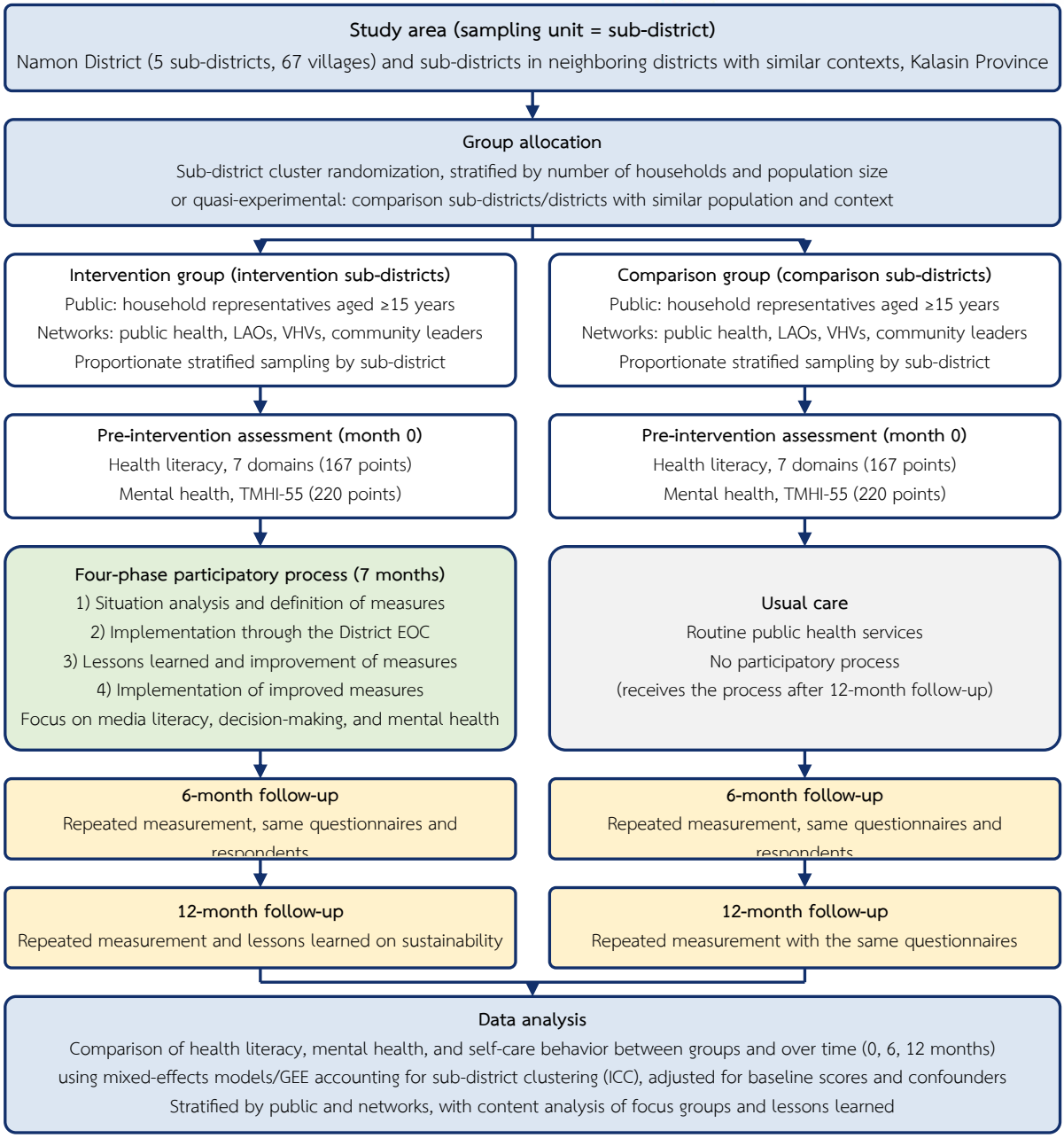

Figure 1 Participatory development process of health literacy and mental health

Discussion

Before the intervention, the situation in the area reflected the impact of recurring waves of the public health emergency, consistent with studies finding that each wave affected personal and economic problems[12] and that outbreak control requires community awareness and social norms alongside government policy.[13,14] Regarding behaviors, mask wearing and handwashing were well practiced, consistent with previous studies;[9,10,15,16] however, risk behaviors remained, including attending social gatherings, sharing personal items, and eating with others, contrary to recommendations.[15] This may be because the lifestyle of people in northeastern

Thailand (Isan) favors communal meals and traditional gatherings; community forum participants likewise reported that merit-making ceremonies, funerals, and communal meals were important traditions that were difficult to change during the outbreak. Overall health literacy was moderate and appropriate decision-making was low, which was inconsistent with a study that found high public health literacy in all domains,[17] but consistent with its finding of poor media literacy, as many people believed fake news.[17] Mental health was moderate, consistent with studies finding that selective attention to and recall of news affected anxiety[18] and that social distancing caused stress.[12] Although a study of medical personnel found a low overall prevalence of mental health problems,[19] moderate or higher levels of stress and depression were found among disease control workers.[20]

The participatory development process in this study relied on collaboration across all sectors, from data and situation analysis, outbreak investigation and disease control, lessons learned, integrated planning and budget allocation, and establishment of service points to community operations, with the District Chief Officer chairing the Emergency Operations Center. This is consistent with the COVID-19 surveillance, prevention, and control model of Udon Thani Province, whose key success factor was the participation of the District Quality of Life Development Committee and stakeholder networks,[11] and with rapid case and contact finding through the participation of village health volunteers and communities.[13] The process also aligns with the concept of health literacy, which emphasizes accessing, understanding, appraising, and using health information,[7] and may therefore be piloted for other public health emergencies, such as mpox.[3] However, most activities were disease-response tasks rather than direct health literacy development, so it cannot be determined which activities affected the scores, and application to other diseases remains a conceptual proposal. Lessons learned identified success factors, including the District Chief Officer chairing the Emergency Operations Center, the participation of VHVs and community leaders, and rapid communication through village broadcasting towers; barriers included rumors, infectious waste, personnel workload, and frequent changes in practice guidelines.

After the intervention, overall health literacy, mental health, and disease prevention behaviors increased significantly ($p<0.001$), consistent with a study finding a moderate positive correlation between knowledge and self-protection behaviors,[9] but inconsistent with a study that found no difference in knowledge and self-protection behavior scores.[21] This small improvement is consistent with a systematic review finding that educational and behavioral modification interventions had only a small effect on preparedness behaviors, with very low certainty of evidence.[22] Media literacy had the smallest effect size (difference 1.00, d = 0.20), possibly because media literacy is difficult to develop and media have many channels and often present information negatively, so the government needs to adapt its presentation and allow more time. Stakeholder network personnel scored higher than the public in all compared domains, possibly because they drove the

measures and received information and hands-on practice directly; however, part of the difference existed before the intervention. This is consistent with a study in southern Thailand that found most VHVs had adequate COVID-19 preventive behaviors, whereas most residents did not.[23] Limitations of this study include a one-group pre–post design without a control group, a 7-month study period, and self-administered questionnaires. Observed changes may have been influenced by the evolving outbreak over time; the researcher developed the process and may have introduced bias; respondents may have given socially desirable answers; replacing uncontactable participants with the next names on the list may have caused selection bias; the same questionnaire was used before and after (testing effect); measures were adjusted during the study; confounders were not adjusted for; data within villages may have been correlated; results are specific to one district; and there was no long-term follow-up.

Conclusion

The participatory development of health literacy and mental health for public health emergency response in Namon District, Kalasin Province, from October 2025 to April 2026 among 585 participants found that health literacy and mental health were at a moderate level before the intervention. The developed process comprised seven groups of measures implemented in four phases. After the participatory intervention with stakeholder networks, scores for health literacy (133.40 to 138.90), mental health (161.30 to 165.70), and self-care behavior (40.70 to 41.80) increased significantly ($p<0.001$), and stakeholder network personnel had higher health literacy and mental health than the public. However, these results reflect pre–post changes in a single group with small effect sizes; therefore, no causal conclusions can be drawn.

Recommendations

1. Recommendations for applying the findings: This participatory process should be piloted and further evaluated to prepare for other public health emergencies through the District Emergency Operations Center, emphasizing risk communication and community mental health care, and adding activities to strengthen media literacy and appropriate decision-making.

2. Recommendations for future research: Future studies should compare with neighboring districts, test the model and measures in other areas, and follow up over a longer period, using a quasi-experimental design with a comparison group or a sub-district-level cluster randomized design, with follow-up at 6 and 12 months.

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References

1. World Health Organization. COVID-19 epidemiological update – Edition 176 [Internet]. Geneva: World Health Organization; 2025 Feb 13 [cited 2026 Apr 5]. Available from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/ceu176.pdf
2. Department of Disease Control, Ministry of Public Health. Situation report of the Emergency Operations Center for COVID-19 [Internet]. Nonthaburi: Department of Disease Control; 2021 Aug 8 [cited 2026 Nov 5]. Available from: https://ddc.moph.go.th/viralpneumonia/ (in Thai)
3. World Health Organization. Fifth meeting of the International Health Regulations (2005) Emergency Committee regarding the upsurge of mpox 2024 [Internet]. Geneva: World Health Organization; 2025 Oct 30 [cited 2026 Apr 5]. Available from: https://www.who.int/news/item/30-10-2025-fifth-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-upsurge-of-mpox-2024
4. Kalasin Provincial COVID-19 Command Center. Situation report of COVID-19 in Kalasin Province. Kalasin: Kalasin Provincial Public Health Office; 2020 Apr 9. (in Thai) (internal report)
5. Namon Hospital. Report of the Emergency Operations Center for COVID-19, Namon District. Kalasin: Kalasin Provincial Public Health Office; 2021. (in Thai) (internal report)
6. Sørensen K, Van den Broucke S, Fullam J, Doyle G, Pelikan J, Slonska Z, et al. Health literacy and public health: a systematic review and integration of definitions and models. BMC Public Health. 2012;12:80.
7. Nutbeam D. The evolving concept of health literacy. Soc Sci Med. 2008;67(12):2072-8.
8. Department of Mental Health, Ministry of Public Health. Operational manual for mental health crisis assistance and healing teams during the COVID-19 outbreak [Internet]. 2020 [cited 2026 Apr 5]. Available from: https://www.dmh.go.th/covid19/pnews/view.asp?id=1 (in Thai)
9. Glomjai T, Kaewjiboon J, Chachvarat T. Knowledge and behaviors of the public on self-protection against the novel coronavirus 2019. J Nurs Public Health Educ. 2020;21(2):29-39. (in Thai)
10. Khamsaen N. Knowledge, attitudes, and self-protection behaviors against COVID-19 among residents of U-Thong District, Suphanburi Province, 2021. J Phrachomklao Coll Nurs Phetchaburi Prov. 2021;4(1):33-48. (in Thai)
11. Ketdao R, Thiengtrongdee A, Thoin P. Development of a surveillance, prevention and control model for COVID-19 in sub-district health promoting hospitals, Udon Thani Province: Udon Model COVID-19. J Health Sci. 2021;30(1):53-61. (in Thai)
12. Samatthanakun R. Impact of the COVID-19 pandemic on the mental health of nursing students, Faculty of Nursing, Buriram Rajabhat University [independent study]. Buriram: Buriram Rajabhat University; 2021. (in Thai)
13. Nawamawat J, Sittisart V, Lekphet K, Thianthawon P. Participation of village health volunteers and communities in COVID-19 prevention and surveillance using a geographic information system. Nonthaburi: Health Systems Research Institute; 2021. (in Thai)
14. Chanwat T. Behavior of Thai households under the COVID-19 situation in 2020. Nonthaburi: Health Systems Research Institute; 2020. (in Thai)
15. Jaisaen J. COVID-19 prevention behaviors among personnel of the Institute of Public Health Science Research, Department of Medical Sciences [independent study]. Bangkok: Ramkhamhaeng University; 2021. (in Thai)

16. Bunthan W, Whaikit P, Soysang V, Soynak C, Akaratanapol P, Kompayak J. Factors influencing health promotion behaviors for COVID-19 prevention among older adults. Police Nurs J. 2020;12(2):323-37. (in Thai)

17. Wae A. COVID-19 and learning for health behavior modification today. J Health Educ Prof Assoc. 2020;35(1):24-9. (in Thai)

18. Ekpanyaskul S. Factors affecting anxiety from perceiving COVID-19 news among the population outside Bangkok [independent study]. Bangkok: Ramkhamhaeng University; 2021. (in Thai)

19. Netirojjanakul W. Prevalence and associated factors of mental health problems among healthcare personnel at Nakhon Pathom Hospital during the COVID-19 outbreak. Reg 4-5 Med J. 2020;39(4):616-27. (in Thai)

20. Saengsirirak E. Stress and depressive mood among healthcare personnel during the COVID-19 outbreak. J Psychiatr Assoc Thailand. 2020;65(4):400-8. (in Thai)

21. Thinpreepream R, et al. Knowledge and self-protection behaviors against the novel coronavirus 2019 [independent study]. Bangkok: Huachiew Chalermprakiet University; 2021. (in Thai)

22. Amberson T, Heagele T, Wyte-Lake T, Couig MP, Bell SA, Mammen MJ, et al. Social support, educational, and behavioral modification interventions for improving household disaster preparedness in the general community-dwelling population: a systematic review and meta-analysis. Front Public Health. 2024;11:1257714.

23. Saisanan Na Ayudhaya W, Thanapop C, Wongrith P, Loonlawong S, Laor P, Fajriyah R. Health literacy and preventive behaviors towards COVID-19 among village health volunteers and residents in urban and rural areas of upper southern Thailand. Soc Sci. 2023;12(7):377.

24. Department of Health, Ministry of Public Health. Health literacy and health behavior (3E 2S) assessment form, revised edition. Nonthaburi: Department of Health; 2018. (in Thai)

25. Mongkol A, Vongpiromsan Y, Tangseree T, Huttapanom W, Romsai P, Chutha W. The development and testing of Thai mental health indicator (version 2007). Nonthaburi: Department of Mental Health, Ministry of Public Health; 2007. (in Thai)

26. Bloom BS, Hastings JT, Madaus GF. Handbook on formative and summative evaluation of student learning. New York: McGraw-Hill; 1971.

RESEARCH ARTICLE

Effects of a Clinical Nursing Practice Guideline for Dyspnea Self-Management on Self-Management Behavior, Quality of Life, and Emergency Department Visits among Older Adults with Chronic Obstructive Pulmonary Disease, Namon District, Kalasin Province

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Abstract

This two-group pretest–posttest quasi-experimental study aimed to develop a clinical nursing practice guideline for dyspnea self-management and to compare its effects on self-management behavior, quality of life, and emergency department (ED) visits among older adults with chronic obstructive pulmonary disease (COPD) in Namon District, Kalasin Province, from October 2025 to April 2026. Sixty-six older adults with COPD were purposively selected, matched by sex, age and disease severity, and allocated by sub-district to experimental and control groups (n=33 each); 61 (31 and 30, respectively) completed the study. The experimental group received the guideline plus usual care for 8 weeks; the control group received usual care. Instruments included the guideline, a dyspnea self-management behavior questionnaire, and the WHOQOL-BREF-THAI. Data were analyzed using descriptive statistics, paired and independent t-tests, chi-square test, and Fisher's exact test.

After the intervention, the experimental group had significantly higher dyspnea self-management behavior (78.45±6.31) and quality of life (101.22±8.40) scores than at baseline (t=19.80 and 11.32, p<0.001) and than the control group (mean differences 23.35, 95% CI 19.61 to 27.09, and 14.75, 95% CI 10.25 to 19.25; p<0.001). ED visits for dyspnea within 3 months were lower in the experimental group than in the control group (6.45% vs 30.00%; Fisher's exact p=0.022; RR 0.22, 95% CI 0.05 to 0.91). The guideline was associated with better self-management and quality of life and fewer ED visits; a randomized study is needed before wider implementation in primary care units and community networks.

Keywords: Quality of life, Older adults, Chronic obstructive pulmonary disease, Dyspnea, Clinical nursing practice guideline

Introduction

Chronic obstructive pulmonary disease (COPD) is a major global public health problem and the fourth leading cause of death worldwide, accounting for 3.5 million deaths in 2021, or approximately 5% of all deaths,[1] with about 213 million people affected globally.[2] Thailand has approximately 1.5 million COPD patients, or about 5% of the population aged 30 years and older.[3] Thailand has also become a complete aged society, with older adults accounting for 21.31% of the population (13,826,163 people as of 31 May 2025),[22] a figure projected to reach 20.5 million, or 32% of the total population, by 2040.[4] Age-related changes in the respiratory system, including reduced lung elasticity and restricted chest wall movement, make older adults with COPD prone to breathlessness, affecting their ability to perform daily activities and their quality of life.

According to the Health Data Center (HDC), Kalasin Province has 154,961 older adults (19.21%). Namon District has a population of 36,388, of whom 4,476 (12.30%) are older adults, with a life expectancy of 72.08 years (fiscal year 2025).[5] Although Namon Hospital operates a long-term care system in which care managers and caregivers conduct home visits, 60% of older adults with COPD still have uncontrolled symptoms (112 of 186 with mMRC ≥ 2 or CAT ≥ 10) and frequently visit the emergency department (ED) because they continue to smoke and cannot avoid triggers such as dust and air pollution. Moreover, the hospital's care pathway focuses mainly on physician-led treatment, and there is no systematic nursing practice guideline to help older adults manage dyspnea themselves at home.

COPD causes permanent airway narrowing, resulting in dyspnea, productive cough, and reduced ability to perform daily activities,[6] as well as psychosocial problems.[7] The Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2026 report recommends education and self-management alongside pharmacological treatment,[8] and a Cochrane systematic review found that self-management programs improve quality of life and reduce respiratory-related hospital admissions, albeit with small effects (mean SGRQ reduction 2.86 points; OR 0.75, 95% CI 0.57 to 0.98).[9] Lorig and Holman's self-management concept emphasizes problem solving, decision making, and resource utilization.[10] In Thailand, self-management and health literacy programs have been developed for older adults with COPD,[11,12] and quality nursing care should be based on evidence-based clinical practice guidelines.[13,14] However, clinical nursing practice guidelines for dyspnea self-

management among older adults with COPD that are integrated with the long-term care system and network partners in rural community settings are still lacking.

The researcher therefore developed a clinical nursing practice guideline for dyspnea self-management among older adults with COPD, aligned with physicians' treatment guidelines, to relieve symptoms, prevent exacerbations, and promote quality of life. The findings will benefit Namon Hospital, sub-district health promoting hospitals (SHPHs), care managers, and caregivers in caring for older adults with COPD in the community, help reduce ED visits, and inform the future development of elderly care systems.

Objectives

1. To develop a clinical nursing practice guideline for dyspnea self-management among older adults with chronic obstructive pulmonary disease that is appropriate to the context of Namon District, Kalasin Province.
2. To evaluate the implementation of the guideline in caring for older adults with COPD in the community in collaboration with network partners, in terms of activity completeness and participant attendance.
3. To compare dyspnea self-management behavior, quality of life, and ED visits before and after use of the guideline and between the experimental and control groups, with dyspnea self-management behavior as the primary outcome.

Methods

This two-group pretest–posttest quasi-experimental study was conducted in communities of Namon District, Kalasin Province, from October 2025 to April 2026 in three phases. Phase 1 (October 2025) involved developing the guideline from a review of evidence (PubMed, CINAHL, Cochrane Library, ThaiJO, and TCI, 2015–2025; 148 records identified and 12 selected; levels of evidence graded according to the Joanna Briggs Institute (JBI) criteria[13] with AGREE II[16] as the framework), together with a focus group of 12 stakeholders using semi-structured questions, analyzed by content analysis. Phase 2 (November 2025–January 2026) involved participant selection, pretest measurement, and an 8-week trial of the guideline (1 December 2025–25 January 2026). Phase 3 (26 January–April 2026) involved a 3-month follow-up of ED visits. Details are as follows.

Population

Older adults aged 60 years and over who were diagnosed with COPD and treated at Namon Hospital in fiscal year 2025 (n=186). Of these, 98 were screened, 71 met the criteria, and 5 declined, leaving 66 participants from 4 sub-districts (2 sub-districts per group).

Sample

The sample size was calculated using G*Power (two-tailed independent t-test, effect size 0.80, significance level .05, power 0.80),[15] yielding 26 per group; the effect size was based on studies of self-management programs among older adults with COPD in Thailand.[11,12] After adding 20% for attrition, the sample comprised 33 per group (66 in total). Participants were purposively selected and matched by sex, age, and disease severity. The experimental group was drawn from Namon Sub-district and the control group from Yot Kaeng Sub-district, which have similar contexts and distances from the hospital, to prevent contamination (sub-districts were not randomized owing to staffing constraints). During the study, 5 participants withdrew or were lost to follow-up (experimental group, 2: relocation 1 and attendance below 80% 1; control group, 3: relocation 1 and unreachable 2), leaving 61 (31 experimental and 30 control), which still provided 0.80 power to detect an effect size of $d \geq 0.73$.

Inclusion Criteria

1) Aged 60 years or older; 2) diagnosed with COPD by a physician, with post-bronchodilator FEV1/FVC below 0.70, and clinically stable for at least 4 weeks; 3) GOLD severity grade 1–3; 4) residing in Namon District for at least 6 months; 5) able to communicate in Thai and having a caregiver or village health volunteer (VHV) nearby; and 6) willing to participate.

Exclusion Criteria

1) Respiratory failure or need for continuous home oxygen therapy (GOLD grade 4); 2) cognitive impairment or psychiatric disorders (screened with the MMSE-Thai 2002); and 3) severe comorbidities such as infectious pulmonary tuberculosis, lung cancer, or severe heart failure. Withdrawal criteria were a request to withdraw, relocation, death, or attendance below 80%. A supplementary intention-to-treat analysis (last observation carried forward) was performed.

Research Instruments

The instruments comprised 1) intervention instruments: the clinical nursing practice guideline, a dyspnea management handbook, a demonstration video, and a symptom diary, which were reviewed by 5 experts (S-CVI/Ave 0.92) and quality-appraised using AGREE II;[16] and 2) data collection instruments: 2.1) a demographic questionnaire; 2.2) a dyspnea self-management behavior

questionnaire developed by the researcher based on Lorig and Holman's concept,[10] comprising 20 items in 4 domains (dyspnea management, medication use and trigger avoidance, exercise and nutrition, and exacerbation management) rated on a 5-point scale, with total scores of 20–100 (20–46 = low, 47–73 = moderate, 74–100 = high), IOC of 0.80–1.00, and Cronbach's alpha of 0.86 (n=30) and 0.88 in the study sample; 2.3) the World Health Organization Quality of Life–BREF, Thai version (WHOQOL-BREF-THAI), 26 items, scores 26–130[17] (26–60 = poor, 61–95 = moderate, 96–130 = good), reliability 0.84; and 2.4) a record form for ED visits for dyspnea from Namon Hospital medical records (ICD-10 J44.0, J44.1, or R06.0), coded by staff blinded to group allocation.

Data Collection

The researcher and research assistants (2 trained registered nurses who did not deliver activities to the experimental group) explained the study objectives and obtained informed consent. Pretest measurements were taken in November 2025. The experimental group received the guideline at home and at the SHPH as shown in Table 1, together with usual care, with follow-up visits by caregivers and VHVs. The control group received usual care (medication and follow-up at the COPD clinic every 1–3 months, individual health education, and home visits under the long-term care plan). Posttest measurements were taken in week 8 (19–25 January 2026), and ED visits were followed up from medical records for 3 months. At the end of the study, the control group received the same handbook and advice as the experimental group.

Data Analysis

Data were analyzed using IBM SPSS Statistics version 29. Descriptive statistics included frequency, percentage, mean, and standard deviation. Within-group comparisons used the paired t-test, between-group comparisons used the independent t-test, and proportions of ED visits were compared using the chi-square test and Fisher's exact test, with risk ratios and 95% CIs reported. Data were normally distributed (Shapiro–Wilk p>.05), and homogeneity of variance was examined using Levene's test. The significance level was set at .05 (a Bonferroni-adjusted level of 0.017 was considered for the 3 primary outcomes), and ANCOVA adjusting for pretest scores was used to confirm the between-group comparisons.

Research Ethics

This study was approved by the Human Research Ethics Committee of the Kalasin Provincial Public Health Office before the focus group and the guideline trial began. Participants' rights were protected by explaining the objectives, procedures, benefits, and risks of the study, and written

informed consent was obtained before participation. All data were kept confidential and presented in aggregate, and participants could withdraw at any time without affecting their treatment.

Results

1. Development of the Clinical Nursing Practice Guideline for Dyspnea Self-Management (Objective 1)

1.1 Situation and problem analysis Sixty percent of older adults with COPD in Namon District had uncontrolled symptoms and frequently visited the ED because they continued to smoke and could not avoid triggers. A focus group of 12 multidisciplinary team members, care managers, and caregivers identified 4 additional problems: 1) lack of breathing skills to relieve breathlessness, 2) incorrect inhaler use, 3) no action plan for exacerbations, and 4) lack of continuous follow-up at home.

1.2 Guideline development and quality assessment The developed guideline comprised 6 components linked to the supporting evidence and expected outcomes, as shown in Figure 1. Five experts (2 senior registered nurses specializing in respiratory care, 1 internist, 1 nursing instructor, and 1 pharmacist) reviewed the guideline, yielding a CVI of 0.92. The AGREE II quality score from 4 appraisers was 86.40% (domain scores 80.21–91.67%). After a pilot with 5 older adults with COPD, the wording and materials were simplified before actual implementation.

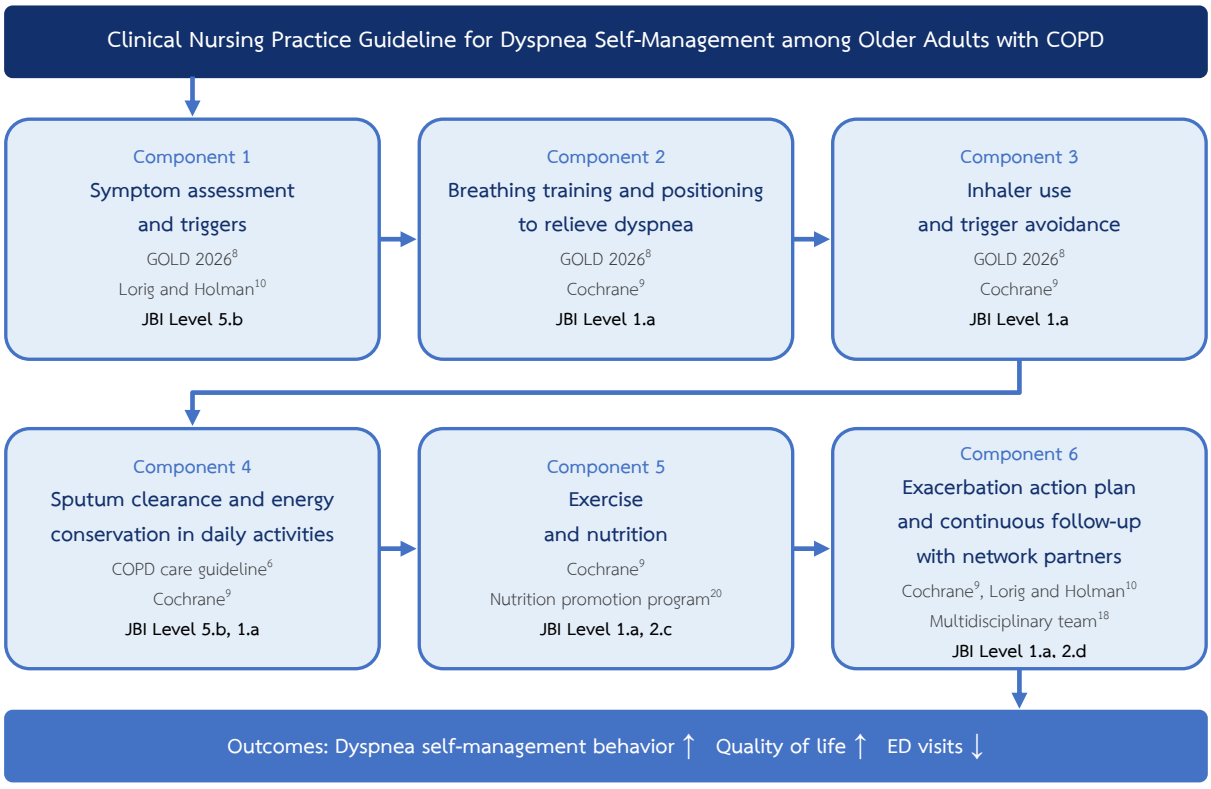

Figure 1 Components of the clinical nursing practice guideline, supporting evidence, and levels of evidence

Note: Levels of evidence were graded according to the JBI criteria;[13] these are approximate and should be verified against the original sources.

2. Implementation of the Guideline in Caring for Older Adults with COPD in the Community (Objective 2)

2.1 Guideline activities The experimental group received activities for 8 weeks, twice weekly, approximately 20 minutes per session (30 minutes in weeks 1 and 8; approximately 300 minutes in total), led by registered nurses at home (64.29%) or at the SHPH (35.71%) together with caregivers and VHVs. Mean attendance in the experimental group was 94.24% of 14 sessions (range 85.71–100%), and 25 of 31 participants (80.65%) attended all sessions, as shown in Table 1.

Table 1 Activities of the clinical nursing practice guideline for dyspnea self-management among older adults with chronic obstructive pulmonary disease over 8 weeks

Week	Activities/Content	Materials	Duration	Rationale
1	Assess dyspnea (modified Medical Research Council dyspnea scale: mMRC), oxygen saturation, triggers, and smoking; provide COPD education; and set self-care goals with the older adult	Symptom assessment form, pulse oximeter, dyspnea management handbook	30 min	Assessment and shared goal setting are the first steps of self-management[10]
2	Teach and practice pursed-lip breathing, diaphragmatic breathing, and the forward-leaning sitting position	Demonstration video, symptom diary	20 min × 2	Breathing techniques reduce air trapping and breathlessness[8]
3	Demonstrate inhaler use with return demonstration; advise on avoiding triggers (cigarette smoke, dust, smoke from fires); and provide smoking cessation counseling	Inhaler demonstration devices, inhaler-use checklist, poster	20 min × 2	Smoking cessation and correct medication use are key to disease control and exacerbation prevention[8]

Week	Activities/Content	Materials	Duration	Rationale
4	Teach effective coughing for sputum clearance and energy conservation in daily activities (activity pacing, regular rest)	Flip chart, brochure	20 min × 2	Reduces the work of breathing and helps older adults perform daily activities independently[6,9]
5	Practice home exercise (walking, arm raising with breathing) and provide nutritional advice	Exercise picture sheet, diary	20 min × 2	Exercise and self-management improve functional capacity and quality of life[8,9]
6	Develop an exacerbation action plan (green–yellow–red zones) and channels for seeking help (call 1669 and Namon Hospital)	Action plan card, LINE group	20 min × 2	Recognizing warning signs and seeking timely help reduce emergency visits[9,10]
7	Manage stress and anxiety (relaxation) and involve family, caregivers, and VHVs in care	Stress assessment form, caregiver handbook	20 min × 2	Psychosocial problems affect the quality of life of older adults with COPD[7]
8	Review knowledge and skills using teach-back, conduct posttest measurement, and hand over information to care managers and SHPHs	Dyspnea self-management behavior questionnaire, WHOQOL-BREF-THAI	30 min	Reassessment and continuous follow-up help sustain behavior change[10]

2.2 Participant characteristics Most participants in the experimental (n=31) and control (n=30) groups were male (70.97% and 70.00%), with mean ages of 68.74±6.12 and 69.20±5.87 years; 35.48% and 36.67% were current smokers, and most had GOLD grade 2 disease (54.84% and 56.67%). No characteristic differed significantly between the groups (p>0.05), as shown in Table 2.

Table 2 Comparison of participant characteristics between the experimental and control groups

Characteristic	Experimental group (n=31)	Control group (n=30)	p-value
Male, n (%)	22 (70.97)	21 (70.00)	0.934

Age (years), $\bar{x}$±S.D.	68.74±6.12	69.20±5.87	0.766
Current smoker, n (%)	11 (35.48)	11 (36.67)	0.923
Disease duration (years), $\bar{x}$±S.D.	5.82±3.10	6.15±3.35	0.691
GOLD grade 1, n (%)	4 (12.90)	4 (13.33)	0.982
GOLD grade 2, n (%)	17 (54.84)	17 (56.67)	
GOLD grade 3, n (%)	10 (32.26)	9 (30.00)	
At least 1 comorbidity, n (%)	18 (58.06)	17 (56.67)	0.912
Primary education or lower, n (%)	21 (67.74)	20 (66.67)	0.929
Dyspnea mMRC ≥ 2, n (%)	14 (45.16)	13 (43.33)	0.886
ED visit in the 3 months before the intervention, n (%)	3 (9.68)	4 (13.33)	0.71

3. Comparison of Dyspnea Self-Management Behavior, Quality of Life, and ED Visits (Objective 3)

3.1 Within-group comparison before and after the intervention After the intervention, the experimental group had significantly higher mean scores for dyspnea self-management behavior (78.45±6.31) and quality of life (101.22±8.40) than before (52.84±8.12 and 84.35±9.10) (t=19.80 and 11.32, df=30, p<0.001), whereas the control group showed no significant change in either score (p=0.078 and 0.229), as shown in Table 3.

Table 3 Comparison of mean dyspnea self-management behavior and quality of life scores before and after receiving the guideline, by group (paired t-test)

Variable	Group	Before		After		Level	$\bar{d}$	95%CI	t	p-value
		$\bar{x}$	S.D.	$\bar{x}$	S.D.					
Dyspnea self-management behavior (max. 100)	Exp.	52.84	8.12	78.45	6.31	M⟶H	25.61	22.97- 28.25	19.80	<0.001*
Dyspnea self-management behavior (max. 100)	Ctrl.	53.40	7.95	55.10	8.20	M⟶M	1.70	-0.20- 3.60	1.83	0.078

Variable	Group	Before		After		Level	d̄	95%CI	t	p-value
		$\bar{x}$	S.D.	$\bar{x}$	S.D.					
Quality of life (max. 130)	Exp.	84.35	9.10	101.22	8.40	M⟶G	16.87	13.83- 19.91	11.32	<0.001*
Quality of life (max. 130)	Ctrl.	85.10	9.32	86.47	9.15	M⟶M	1.37	-0.91- 3.65	1.23	0.229

*Statistically significant at p-value <.05; Exp. = experimental group, Ctrl. = control group; M = moderate, H = high, G = good

3.2 Between-group comparison Before the intervention, mean scores in both domains did not differ between the groups (p=0.787 and 0.752). After the intervention, the experimental group had significantly higher dyspnea self-management behavior and quality of life scores than the control group (55.10±8.20 and 86.47±9.15) (t=12.49 and 6.56, df=59, p<0.001; Cohen's d ≈ 3.20 and 1.68), and ANCOVA adjusting for pretest scores yielded consistent results, as shown in Table 4.

Table 4 Comparison of mean dyspnea self-management behavior and quality of life scores between the experimental and control groups (independent t-test)

Variable	Experimental group		Control group		Level	d̄	95%CI	t	p-value
	$\bar{x}$	S.D.	$\bar{x}$	S.D.					
Dyspnea self-management behavior, before (max. 100)	52.84	8.12	53.40	7.95	M/M	-0.56	-4.68- 3.56	-0.27	0.787
Dyspnea self-management behavior, after (max. 100)	78.45	6.31	55.10	8.20	H/M	23.35	19.61- 27.09	12.49	<0.001*
Quality of life, before (max. 130)	84.35	9.10	85.10	9.32	M/M	-0.75	-5.47- 3.97	-0.32	0.752
Quality of life, after (max. 130)	101.22	8.40	86.47	9.15	G/M	14.75	10.25- 19.25	6.56	<0.001*

*Statistically significant at p-value <.05; M = moderate, H = high, G = good

3.3 ED visits for dyspnea During the 3-month follow-up, 2 participants (6.45%) in the experimental group visited the ED, significantly fewer than the 9 (30.00%) in the control group (χ^2=5.72, p=0.017; Yates χ^2=4.24, p=0.040; difference in proportions 23.55 percentage points, 95% CI 5.01 to 42.09). Although the estimate for the experimental group was below the hospital target (≤10%), its exact 95% CI (0.79–21.42) does not allow the conclusion that the target was achieved. In the 3 months before the intervention, ED visits did not differ between the groups (9.68% and 13.33%; Fisher's exact p=0.71), as shown in Table 5.

Table 5 Comparison of ED visits for dyspnea within 3 months between the experimental and control groups (chi-square test)

ED visit	Experimental group (n=31), n (%)	Control group (n=30), n (%)	χ^2	p-value
Visited	2 (6.45)	9 (30.00)	5.72	0.017*
Did not visit	29 (93.55)	21 (70.00)		

*Statistically significant at p-value <.05 (Fisher's exact p=0.022; RR 0.22, 95% CI 0.05 to 0.91)

Discussion

The developed guideline suited the context of Namon District because it was based on an analysis of local problems and developed from evidence together with input from the multidisciplinary team, consistent with the concept of evidence-based practice, which integrates the best available evidence with clinical judgment and patients' needs.[13,14] The AGREE II[16] (86.40%) and CVI (0.92) results indicate good quality, and care by a multidisciplinary team supports continuity of care,[18] consistent with the involvement of care managers, caregivers, and VHVs in home follow-up under this guideline.

The higher self-management behavior and quality of life scores in the experimental group may be attributable to demonstration, repeated practice, teach-back, goal setting, and continuous follow-up visits, which strengthen skills and self-efficacy according to Bandura's concept[19] and the self-management process emphasizing goal setting and problem solving.[10] These findings are consistent in direction with the Cochrane review,[9] the GOLD report,[8] and Thai studies.[11,12] However, the 14.75-point difference in WHOQOL-BREF-THAI quality of life scores was much larger than the effect in the Cochrane review (SGRQ reduction of 2.86 points), which may relate to bias from unblinded self-report, non-randomization, and different instruments; therefore, only directional comparisons can be made. In addition, the inclusion of exercise and nutrition in the guideline is consistent with studies among older adults with COPD.[20,21]

The lower ED visit rate in the experimental group (6.45% vs 30.00%) may be explained by participants having an exacerbation action plan, using inhalers correctly, applying breathing techniques, and better avoiding triggers. Although the point estimate was below the hospital target (≤10%), the confidence interval remained wide. Limitations of this study include non-random allocation by sub-district; a small sample from a single district; only 3 months of follow-up; self-reported behavior data and

unblinded data collectors; ED data from a single hospital with only 1 1 events; 5 withdrawals (7.58%); and possible effects of season or air quality on ED visits.

Conclusion

Developing a clinical nursing practice guideline for dyspnea self-management among older adults with COPD yielded a 6-component guideline that passed quality assessment and was implemented for 8 weeks in communities of Namon District. After implementation, the experimental group had significantly higher dyspnea self-management behavior and quality of life scores than before the intervention and than the control group ($p<0.001$), and fewer ED visits than the control group (6.45% vs 30.00%; Fisher's exact test $p=0.022$).

Recommendations

1. Recommendations for applying the findings: The guideline should be further piloted in SHPHs in Namon District with outcome monitoring, and scaled up once confirmed by studies with better control of bias. It should be integrated with the long-term care system, and the competencies of care managers, caregivers, and VHVs should be strengthened so that they understand the continuous care process for older adults with COPD.

2. Recommendations for future research: Randomized controlled studies using sub-district (cluster) randomization and blinded assessors should be conducted, with dyspnea (e.g., mMRC/CAT) and hospitalization as outcomes. Future studies should also expand the sample size and study areas, follow long-term outcomes (6–12 months), and examine the cost-effectiveness of the guideline.

Acknowledgments

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References

1. World Health Organization. Chronic obstructive pulmonary disease (COPD) [Internet]. Geneva: World Health Organization; 2024 [cited 2026 Oct 1]. Available from: https://www.who.int/news-room/fact-sheets/detail/chronic-obstructive-pulmonary-disease-(copd)

2. Wang Z, Lin J, Liang L, Huang F, Yao X, Peng K, et al. Global, regional, and national burden of chronic obstructive pulmonary disease and its attributable risk factors from 1990 to 2021: an analysis for the Global Burden of Disease Study 2021. Respir Res. 2025;26(1):2.

3. Ministry of Public Health (TH). Health Data Center (HDC) [Internet]. Nonthaburi: Ministry of Public Health; 2025 [cited 2026 Oct 1]. Available from: https://hdc.moph.go.th (in Thai)

4. Office of the National Economic and Social Development Council (TH). Population projections for Thailand 2010-2040 (in Thai). Bangkok: Office of the National Economic and Social Development Council; 2010.

5. Namon Hospital. Health data center report, Namon District, Kalasin Province (in Thai). Kalasin: Kalasin Provincial Public Health Office; 2021.

6. Lertudomsin S. Guideline for the care of patients with chronic obstructive pulmonary disease. In: Lertudomsin S, editor. Pharmaceutical care for asthma, allergic rhinitis and chronic obstructive pulmonary disease (in Thai). Khon Kaen: Klungnana Vitthaya; 2010. p. 143-5.

7. Chanta D, Piyawatanapong S, Banharak S. Psychosocial health status of older adults with chronic obstructive pulmonary disease attending the asthma and emphysema clinic, Srinagarind Hospital (in Thai). In: Proceedings of the 20th National Graduate Research Conference; 2019 Mar 15; Khon Kaen. Khon Kaen: Khon Kaen University; 2019. p. 932-42.

8. Global Initiative for Chronic Obstructive Lung Disease. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease: 2026 report [Internet]. GOLD; 2025 [cited 2026 Nov 5]. Available from: https://goldcopd.org/wp-content/uploads/2025/12/GOLD-REPORT-2026-v1.3-8Dec2025_WMV.pdf

9. Schrijver J, Lenferink A, Brusse-Keizer M, Zwerink M, van der Valk PD, van der Palen J, et al. Self-management interventions for people with chronic obstructive pulmonary disease. Cochrane Database Syst Rev. 2022;(1):CD002990. doi:10.1002/14651858.CD002990.pub4.

10. Lorig KR, Holman H. Self-management education: history, definition, outcomes, and mechanisms. Ann Behav Med. 2003;26(1):1-7.

11. Chanamarn P. Development of a self-management program for older adults with chronic obstructive pulmonary disease (in Thai). J Nurs Public Health Educ. 2018;19(1):61-72.

12. Donchai J. Effects of teaching based on Pitts' principles to promote health literacy on self-management among older adults with chronic obstructive pulmonary disease [master's thesis] (in Thai). Chiang Mai: Chiang Mai University; 2023.

13. Joanna Briggs Institute. JBI levels of evidence [Internet]. Adelaide: Joanna Briggs Institute; 2014 [cited 2026 Nov 5]. Available from: https://jbi.global/sites/default/files/2019-05/JBI-Levels-of-evidence_2014_0.pdf

14. Institute of Hospital Quality Improvement and Accreditation. Hospital and healthcare standards, commemorating the 60th anniversary of His Majesty's accession (in Thai). Nonthaburi: D-One; 2008.

15. Faul F, Erdfelder E, Lang AG, Buchner A. G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behav Res Methods. 2007;39(2):175-91.

16. Brouwers MC, Kho ME, Browman GP, Burgers JS, Cluzeau F, Feder G, et al. AGREE II: advancing guideline development, reporting and evaluation in health care. CMAJ. 2010;182(18):E839-42.

17. Mahatnirunkul S, Tuntipivatanaskul W, Pumpaisalchai W. Comparison of the WHOQOL-100 and the WHOQOL-BREF (26 items) (in Thai). J Ment Health Thai. 1998;5(3):4-15.

18. Raksayot J, Sitthiban S. Effects of a care model for patients with chronic obstructive pulmonary disease at the Khon Rak Pod clinic, Somdet Phra Yuparat Chawang Hospital (in Thai). J Health Sci. 2013;22(6):974-8.

19. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. Psychol Rev. 1977;84(2):191-215.

20. Yodchai K, Thongsong P. Effects of a nutrition promotion program on nutrition-related health behaviors and nutritional status among older adults with chronic obstructive pulmonary disease and malnutrition (in Thai). Songklanagarind J Nurs. 2020;39(4):1-15.

21. Wattanapongsathit P. Factors related to resilience among older adults with chronic obstructive pulmonary disease (in Thai). J Boromarajonani Coll Nurs Bangkok. 2016;32(3):24-36.

22. Department of Provincial Administration (TH). Population statistics by age group [Internet]. Bangkok: Ministry of Interior; 2025 [cited 2026 Nov 5]. Available from: https://stat.bora.dopa.go.th/new_stat/webPage/statByAgeMonth.php (in Thai)

RESEARCH ARTICLE

Development and Preliminary Evaluation of a Dengue Hemorrhagic Fever Problem-Solving Model through the District Health Board (DHB) in Namon District, Kalasin Province

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Abstract

This research and development study aimed to examine the situation, develop a model, and evaluate the outcomes of solving dengue hemorrhagic fever (DHF) problems through the District Health Board (DHB) using a participatory larvivorous gourami fish innovation. The study was conducted from January 2025 to April 2026. The sample comprised 381 residents and 204 dengue-prevention network partners (n = 585), calculated using the finite-population proportion formula and selected by proportional stratified random sampling by subdistrict. Research instruments were group-process and community-forum guides, the R506 surveillance report, an Aedes larval index survey form (HI/CI), a larvae-consumption record form for surface-feeding predatory fish, and an innovation satisfaction questionnaire. Data were analyzed using descriptive statistics, independent t-test, and chi-square test at a significance level of 0.05.

Preliminary data (2010–2018) showed that dengue in Namon District followed an alternate-year pattern. In 2015 there were 80 cases (204.21 per 100,000 population), mostly students aged 10–14 years, and container indices (CI) in 2013–2015 were 17.16, 12.58 and 13.66. The model comprised six UCCARE-based measures driven through the DHB and the district Emergency Operations Center (EOC). Gourami fish consumed 18.45 larvae per fish per day (5,535.00 larvae per 30 fish over 10 days). In the 2016–2018 pilot phase, cases were 21, 36 and 5 (2018 incidence 12.76 per 100,000) and satisfaction scores rose from 31.96 to 42.06 ($t = -28.23$, $p < 0.001$). From January 2025 to April 2026, 16 cases were reported (40.82 per 100,000) with no deaths; House Index (HI) decreased from 8.21 to 3.08, CI from 7.94 to 2.91, and satisfaction rose from 33.48±5.12 to 41.37±6.84 ($t = -22.34$, $p < 0.001$). The DHB-driven model strengthened collaboration among network partners and communities and may be scaled up to neighboring districts after confirmation in a controlled study.

Keywords: Dengue hemorrhagic fever, District Health Board, community participation

Introduction

Dengue hemorrhagic fever is an Aedes-borne communicable disease that has increased faster than other communicable diseases. The World Health Organization reported that the number of reported cases rose from 505,430 in 2000 to 14,434,584 in 2024, with 11,201 deaths.[1] In Thailand, clear outbreaks have been reported since 1958, beginning in Bangkok and then spreading to all regions. In 1987, the highest number of cases ever recorded was reported (174,285 cases, 1,007 deaths), and in 2018 there were 85,849 cases, an incidence of 129.96 per 100,000 population.[2] In 2025 (as of 19 August 2025), 38,687 cumulative cases (59.60 per 100,000 population) and 37 deaths were reported, which was below the 5-year median, but the country was still in the epidemic season requiring surveillance.[3]

In Namon District, Kalasin Province, dengue showed an increasing trend in 2013–2015, with incidence rates of 156.81, 180.56 and 204.21 per 100,000 population, respectively (based on a 2015 mid-year population of approximately 39,175). In 2015 there were 80 cases (44 female, 36 male); the 10–14-year age group was most affected (23 cases), students were the most affected occupation (58 cases), and cases peaked in November (13 cases). Namon Subdistrict had the highest incidence (659.90 per 100,000 population). Identified risk factors were the rainy season, larval indices above the standard, travel to epidemic areas, and failure to protect oneself from mosquito bites.[4] At the same time, communities lacked temephos (Abate) sand and guppies, so Uthaiwan Subdistrict Health Promoting Hospital in Lak Liam Subdistrict developed a gourami larvivorous fish innovation using local resources and found it highly effective in controlling Aedes larvae.[5] After district-wide scale-up, there were 21, 36 and 5 cases in 2016–2018, respectively. However, this work had not yet been systematically elevated to the DHB agenda, and its sustainability in subsequent years still needed to be monitored.

The District Health Board (DHB) was established under the Regulation of the Office of the Prime Minister on Area-Based Quality of Life Development B.E. 2561 (2018) to integrate the work of the public, private and civil sectors in solving health problems in line with the local context.[6] It uses the UCCARE components of the District Health System (DHS) as its operational framework,[7] comprising six components: Unity district health team, Customer focus, Community participation, Appreciation, Resource sharing and human development, and Essential care. Previous studies found that the participation of network partners and communities is a key mechanism for dengue prevention and control,[8-10] and the effectiveness of various larvivorous fish has been studied;[11] however, no study has developed a dengue problem-solving model that integrates the gourami larvivorous fish innovation into the DHB mechanism. This is the knowledge gap addressed by the present study.

Therefore, the researcher developed a dengue problem-solving model through the Namon DHB, building on the preliminary data and the gourami larvivorous fish innovation, from January 2025 to April 2026. The findings are expected to guide the DHB and related agencies in community-based dengue control and in scaling up to neighboring districts.

Research Objectives

1. To examine the situation and risk factors of dengue hemorrhagic fever in Namon District, Kalasin Province.
2. To develop a dengue problem-solving model through the District Health Board (DHB) using a participatory gourami larvivorous fish innovation.
3. To evaluate the effects of the developed model on the disease situation, Aedes larval indices, and satisfaction with the innovation.

Methods

This participatory research and development (R&D) study used the UCCARE framework together with the district Emergency Operations Center (EOC). It was conducted in Namon District, Kalasin Province, from January 2025 to April 2026 (16 months) in two cycles: Cycle 1 (R: Research) analyzed the situation, defined measures and network-partner roles, and implemented them; Cycle 2 (D: Develop) drew lessons learned, revised the measures, and continued implementation, as detailed below.

Population

Residents and dengue-prevention network partners in the 5 subdistricts and 67 villages of Namon District, comprising 36,550 residents and 431 network partners (local administrators, community leaders, public health officers, village health volunteers [VHVs] and volunteers).

Sample

The sample size was calculated using the formula for estimating a proportion in a finite population,[12] with a 95% confidence level (Z = 1.96), an acceptable error of 0.05 and a maximum proportion of 0.5, yielding 381 residents and 204 network partners (585 in total). Pre- and post-implementation assessments were collected from independently drawn samples (different sets of participants), with a 100% response rate. The sample was allocated proportionally by subdistrict: Namon 201, Yot Kaeng 126, Song Plueai 112, Lak Liam 82 and Nong Bua 64. Simple random sampling was performed by lottery from household lists (one representative per household) and network-partner lists; if a selected participant could not be found, the next name on the list was used.

Inclusion Criteria

1) Aged 20 years or older and residing in Namon District for at least 1 year; 2) a household representative or a network partner involved in dengue prevention and control; 3) able to communicate in Thai and willing to participate.

Exclusion Criteria

1) Illness preventing the provision of information; 2) moving out of the area during the study; 3) withdrawal from the study.

Research Instruments

The instruments consisted of 1) activity tools: group interview guides, group processes and community forums for situation analysis, defining measures and network-partner roles, lessons learned and revision of measures; and 2) data collection tools: (2.1) the R506 report form; (2.2) the Department of Disease Control Aedes larval index survey form (HI/CI); (2.3) a record form for the larvae-consumption experiment of surface-feeding predatory fish; and (2.4) a satisfaction questionnaire on the gourami larvivorous fish innovation, adapted from the Department of Health innovation satisfaction form,[13] with 5 domains and 10 items (total score 50). Scores were interpreted using Bloom's criteria[14] at 5 levels: Level 1 (10.00–17.99), Level 2 (18.00–25.99), Level 3 (26.00–33.99), Level 4 (34.00–41.99) and Level 5 (42.00–50.00). Content validity was reviewed by 3 experts (IOC = 0.67–1.00), and reliability was 0.89 (Cronbach's alpha).

Data Collection

Data collection comprised 8 steps: 1) collecting and analyzing the situation, risk factors and preliminary data for 2010–2018 (Jan–Mar 2025); 2) a DHB meeting to define measures and activities using the gourami larvivorous fish innovation (Apr 2025); 3) defining network-partner roles (May 2025); 4) implementing the measures and roles (Jun–Dec 2025); 5) drawing lessons on problems, obstacles and solutions (Jan 2026); 6) revising the measures and network-partner roles (Feb 2026); 7) implementing the revised measures (Mar–Apr 2026); and 8) summarizing lessons learned and analyzing data (Apr 2026). The efficacy experiment tested 13 species of surface-feeding predatory fish, 30 fish per species, selecting the healthiest and largest individuals. Fish were kept in 160-liter jars filled with 120 liters of water and covered with fine mesh, starved for 2 days, and then given batches of 100 Aedes larvae over a 10-day life cycle; the number of larvae eaten between 06:00 and 18:00 was recorded daily. Data were collected by trained public health officers and VHVs. HI/CI surveys of sampled households and satisfaction assessments were conducted before (Jan–Mar 2025) and after implementation (Apr 2026).

Data Analysis

Data were processed using RStudio (R version 4.4.1). Descriptive statistics included frequency, percentage, mean ($\bar{x}$) and standard deviation (S.D.). Inferential statistics included the independent t-test to compare satisfaction scores before and after implementation and between network partners and residents, and the chi-square test to compare the proportion of households with Aedes larvae before and after implementation. The significance level was set at .05, and mean differences were reported with 95% CIs. Case trends were analyzed using the 5-year retrospective median and exponential smoothing forecasts.

Research Ethics

This study adhered to the ethics of human research. The researcher explained the objectives and procedures to participants, who gave voluntary written informed consent. Data were kept confidential and presented in aggregate, and participants could withdraw at any time without affecting the services they received.

Results

1. Situation and Risk Factors of Dengue Hemorrhagic Fever in Namon District

1.1 Preliminary data, 2010–2018. Namon District showed an alternate-year epidemic pattern. In 2015, 80 cases were reported, 33.33% above the 5-year median (median = 60 cases in 2010–2014), and exponential smoothing forecasts indicated an upward trend. The incidence was 204.21 per 100,000 population (95% CI 161.93 to 254.16), with no deaths; 44 cases were female and 36 male (1.22:1). The 10–14-year age group was most affected (23 cases), followed by 5–9 years (21) and 15–24 years (16). By occupation, there were 58 students, 11 farmers and 4 dependents, and cases peaked in November (13 cases). CI values in 2013–2015 were 17.16, 12.58 and 13.66, respectively. Containers most often positive for larvae were household drinking and domestic water containers (79.85%), followed by plants (10.13%), tires (5.20%) and waste (4.80%).

1.2 Situation during implementation. From January 2025 to April 2026, 16 cases were reported (14 in 2025 and 2 in January–April 2026), an incidence of 40.82 per 100,000 population (16 months; 95% CI 23.33 to 66.29; equivalent to 30.62 per 100,000 per year), with no deaths. The 14 cases in 2025 were 54.84% below the 5-year median (median = 31 cases in 2020–2024). Of the 16 cases, 9 were male (56.25%) and 7 female (1.29:1). The 5–9-year age group was most affected (5 cases), followed by 10–14 years (4) and 15–24 years (3). By occupation, there were 9 students, 3 dependents and 2 farmers; cases peaked in August (4 cases). The disease was controlled within the first generation in all 12 affected villages, i.e., no new cases occurred in the same village within 28 days of the onset of the first case.

2. Development of the Dengue Problem-Solving Model through the DHB

2.1 Steps and activities of model development. Eight steps were carried out from January 2025 to April 2026, with the District Chief Officer as commander and the District Public Health Office as secretariat, operating jointly with the district Emergency Operations Center (EOC), as shown in Table 1.

Table 1 Steps, activities, tools, duration and academic rationale of model development

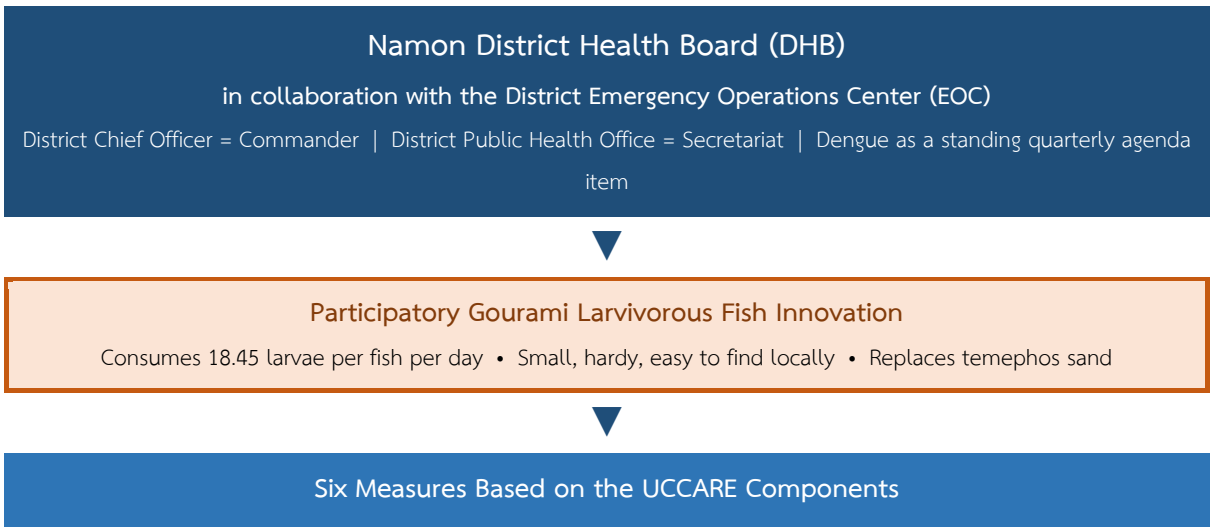
Step	Activity/Content	Tools	Duration	Academic Rationale
1	Collect and analyze the situation, risk factors and preliminary data for 2010–2018	R506 report, HI/CI survey form, group interviews	Jan–Mar 2025 (3 months)	Use epidemiological data to identify risk areas and shared problems[4]
2	DHB meeting to define measures/activities in 6 areas based on UCCARE and activate the EOC during outbreaks	Community forum and group process	Apr 2025 (1 month)	The DHB integrates the public, private and civil sectors to solve health problems[6,7]
3	Define network-partner roles (District Chief Officer, DHO, SHPHs, LAOs, community leaders, VHVs, volunteers)	Community forum and group process	May 2025 (1 month)	Participation of network partners and communities is a key mechanism of disease control[8,9]
4	Implement measures: train VHVs/volunteers, catch gourami fish together, distribute fish, build holding ponds, and campaign to eliminate breeding sites	Gourami fish, fish holding ponds, HI/CI survey form, R506 report	Jun–Dec 2025 (7 months)	Biological control replaces scarce temephos sand; gourami are small, hardy and easy to find locally[5,11]
5	Draw lessons on problems, obstacles and solutions	Group process	Jan 2026 (1 month)	Reflect on practice to improve the next development cycle
6	Revise measures/activities and network-partner roles based on lessons learned	Community forum and group process	Feb 2026 (1 month)	Continuous research and development (R&D) cycle
7	Implement revised measures and collect post-implementation HI/CI and satisfaction data	HI/CI survey form, satisfaction questionnaire	Mar–Apr 2026 (2 months)	Evaluate against the HI/CI <10 criterion and satisfaction levels using Bloom's criteria[14]

Step	Activity/Content	Tools	Duration	Academic Rationale
8	Summarize lessons learned and perform statistical analysis	RStudio	Apr 2026 (1 month)	Summarize the model for district-level scale-up

2.2 The developed model comprised six UCCARE-based measures: 1) Unity district health team: activating the EOC during outbreaks, holding situation-analysis meetings at least monthly, issuing weekly outbreak alerts through the district situational awareness team, and driving the gourami fish innovation policy into communities; 2) Customer focus: promoting gourami fish instead of temephos sand and building gourami holding ponds in communities; 3) Community participation: catching gourami fish together and distributing them for use in communities; 4) Appreciation: campaigns to eliminate larval breeding sites run by community members themselves, supported by health officers, VHVs and local administrative organizations (LAOs); 5) Resource sharing and human development: mobilizing 100% of health officers, volunteers and VHVs during outbreaks and preventing second-generation cases; and 6) Essential care: 24-hour consultation with on-call physicians and timely referral. The DHB also made dengue a standing agenda item at its quarterly meetings and set subdistrict-level HI/CI indicators, as shown in Figure 1.

2.3 Efficacy of surface-feeding predatory fish. Among the 13 species tested, the climbing perch consumed the most larvae, 93.15 larvae per fish per day (Mean±SD = 27,946.20±480.22 larvae/10 days), followed by the gourami, 18.45 per fish per day (Mean±SD = 5,535.00±56.63), and the goby, 18.03 per fish per day (Mean±SD = 5,410.10±109.39), whereas guppies consumed only 5.10 per fish per day (1,528.80 larvae/10 days). The gourami was selected for this model because it is small, hardy, easy to find in communities, and less fishy-smelling than the climbing perch and the goby.

Figure 1 Model obtained from the development



U – Unity district health team

District-level collaboration

Activate EOC during outbreaks; monthly situation analysis; weekly alerts

C – Customer focus

Responding to service users' needs

Use gourami fish instead of temephos sand; build community fish holding ponds

C – Community participation

Network and community participation

Catch gourami fish together and distribute them in communities

A – Appreciation

Working to create value

Communities eliminate breeding sites themselves, supported by health officers, VHVs and LAOs

R – Resource sharing

Resource sharing and human development

Mobilize 100% of health officers, volunteers and VHVs during outbreaks

E – Essential care

Context-appropriate essential health services

24-hour consultation with on-call physicians and timely referral

▼

Two Research and Development (R&D) Cycles

Situation analysis ⟶ Define measures/partner roles ⟶ Implement ⟶ Lessons learned ⟶ Revise measures ↺

▼

Outcomes (Jan 2025 – Apr 2026)

16 cases, no deaths • Disease controlled within the first generation

HI 8.21 ⟶ 3.08 • CI 7.94 ⟶ 2.91 • Satisfaction 33.48 ⟶ 41.37 ($p<0.001$)

3. Effects of the Developed Model

3.1 Comparison of satisfaction scores before and after implementation. In the pilot phase, the 592 participants were 57.60% female and 42.40% male, aged 20–65 years (mean 47.65 years); most were married (54.90%) and farmers (42.40%). In the DHB phase, participants were 58.12% female, with a mean age of 48.20±10.94 years, and 40.17% were farmers. In the pilot phase, the total satisfaction score increased from 31.96±4.74 (Level 3) to 42.06±7.23 (Level 5), a statistically significant increase ($t = -28.23$, $p<0.001$), and scores increased in all domains shown in Table 2 (3 of 5 domains). The items with the highest t values were that gourami fish controlled larvae better than temephos sand ($t = -23.01$), followed by cost-effective and participatory use of resources ($t = -22.84$) and safety ($t = -21.07$). In the DHB phase, the total score increased from 33.48±5.12 (Level 3) to 41.37±6.84 (Level 4), a statistically significant increase ($t = -22.34$, $p<0.001$), as shown in Table 2.

Table 2 Comparison of satisfaction scores with the gourami larvivorous fish innovation before and after implementation, by phase (Independent t-test)

Variable	Group	Before		After		Level	$\bar{d}$	95%CI	t	p-value
		$\bar{x}$	S.D.	$\bar{x}$	S.D.					
Total score (max 50)	Pilot 2016–2018	31.96	4.74	42.06	7.23	3⟶5	10.10	9.40-10.80	-28.23	<0.001*
Total score (max 50)	DHB 2025–2026	33.48	5.12	41.37	6.84	3⟶4	7.89	7.20-8.58	-22.34	<0.001*
Gourami better than temephos (max 5)	Pilot 2016–2018	3.19	0.78	4.37	0.95	3⟶5	1.18	1.08-1.28	-23.01	<0.001*
Gourami better than temephos (max 5)	DHB 2025–2026	3.31	0.74	4.29	0.91	3⟶5	0.98	0.88-1.08	-20.14	<0.001*
Cost-effective, participatory resource use (max 5)	Pilot 2016–2018	3.11	0.78	4.33	1.02	3⟶5	1.22	1.12-1.32	-22.84	<0.001*
Cost-effective, participatory resource use (max 5)	DHB 2025–2026	3.22	0.77	4.21	0.96	3⟶5	0.99	0.89-1.09	-19.87	<0.001*
Safety (max 5)	Pilot 2016–2018	3.24	0.74	4.33	1.01	3⟶5	1.09	0.99-1.19	-21.07	<0.001*
Safety (max 5)	DHB 2025–2026	3.35	0.72	4.30	0.93	3⟶5	0.95	0.85-1.05	-19.52	<0.001*

*Statistically significant at p-value <.05

3.2 Comparison of satisfaction scores between network partners and residents. In the pilot phase, network partners had a mean total score of 37.03, higher than residents (35.55) (difference 1.48 points, 95% CI 0.47 to 2.49, t = 2.87, p = 0.004). In the DHB phase, total scores of network partners and residents did not differ significantly either before or after implementation (p = 0.101 and 0.063, respectively), as shown in Table 3.

Table 3 Comparison of satisfaction scores between network partners and residents (Independent t-test)

Variable	Network partners (n = 204)		Residents (n = 381)		Level	$\bar{d}$	95%CI	t	p-value
	$\bar{x}$	S.D.	$\bar{x}$	S.D.					
Total score (max 50), pilot phase 2016–2018	37.03	5.86	35.55	6.12	4/4	1.48	0.47-2.49	2.87	0.004*
Total score (max 50), before, DHB phase	33.92	4.97	33.20	5.21	3/3	0.72	-0.14-1.58	1.64	0.101
Total score (max 50), after, DHB phase	42.05	6.12	41.01	7.01	5/4	1.04	-0.06-2.14	1.86	0.063
Efficacy domain (max 15), after, DHB phase	13.12	1.84	12.84	2.01	5/5	0.28	-0.04-0.60	1.70	0.090

*Statistically significant at p-value <.05

3.3 Effects on the disease situation and Aedes larval indices. In the pilot phase, after implementing the measures in 2016–2018, there were 21, 36 and 5 cases, respectively (2018 incidence 12.76 per 100,000 population), with no deaths. HI values in 2016–2018 were 9.82, 6.52 and 2.36, and CI values were 8.67, 8.58 and 2.36, respectively, decreasing continuously and remaining within the standard (HI and CI <10). The proportion of households with Aedes larvae decreased significantly (χ^2 = 26.72, p<0.001; RR = 0.24, 95% CI 0.13 to 0.44). In the DHB phase, HI decreased from 8.21% to 3.08% (χ^2 = 14.45, p<0.001; RR = 0.38, 95% CI 0.22 to 0.64) and CI decreased from 7.94 to 2.91, as shown in Table 4.

Table 4 Comparison of the proportion of households with Aedes larvae (HI) before and after implementation, by phase (Chi-square test)

Household status	Before (%)	After (%)	χ^2	p-value
Pilot phase: larvae found (HI)	9.82	2.36	26.72	<0.001*
Pilot phase: no larvae found	90.18	97.64		
DHB phase: larvae found (HI)	8.21	3.08	**14.45**	**<0.001***
DHB phase: no larvae found	91.79	96.92		

*Statistically significant at p-value <.05

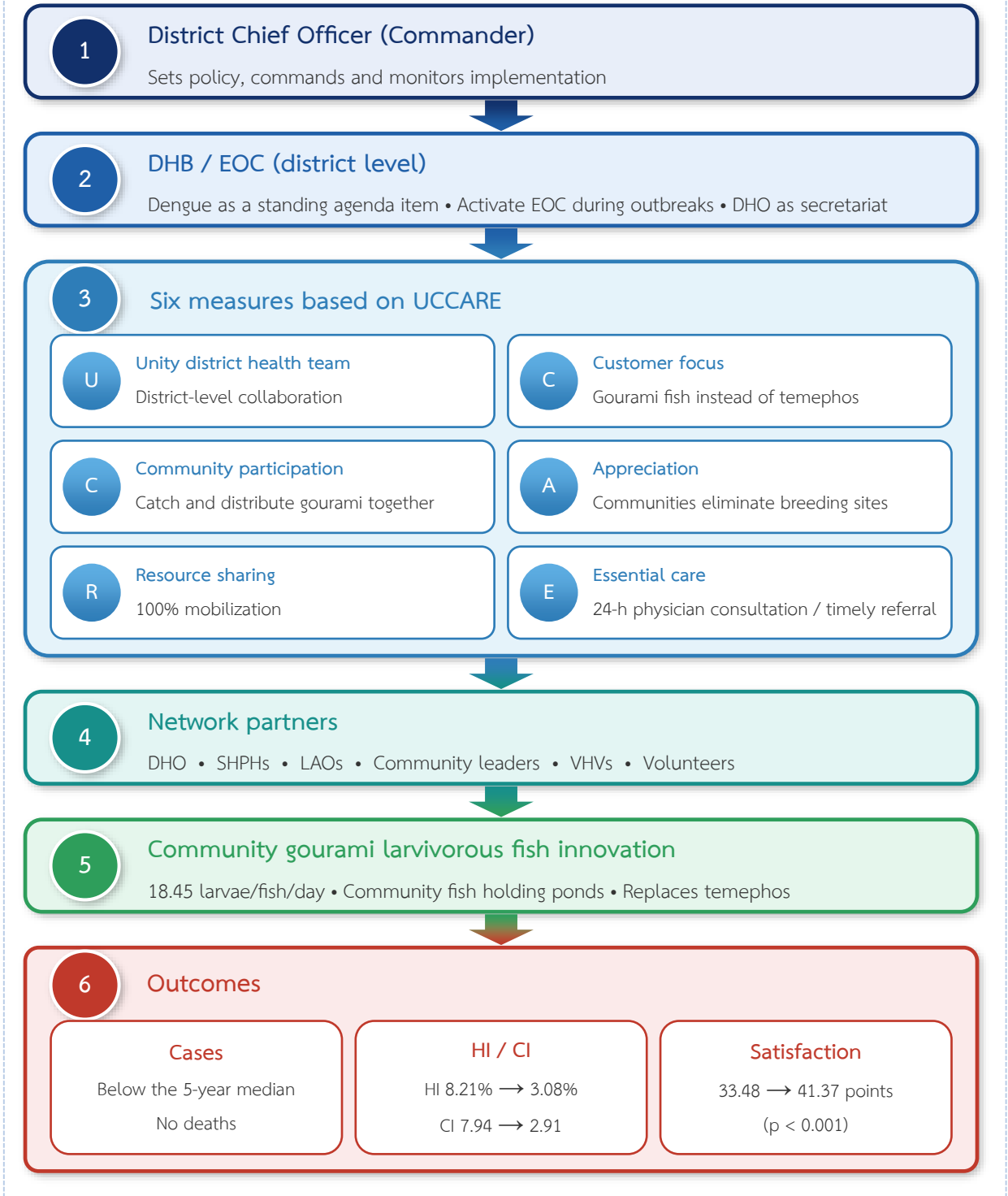


Figure 1 Dengue hemorrhagic fever problem-solving model through the District Health Board (DHB), Namon District, Kalasin Province

Discussion

Dengue in Namon District followed an alternate-year pattern (2010–2015), unlike the report by Chanchainarong Songkhasri,[15] which found two low years followed by two high years. This may relate to differences in topography and rainfall between Namon District and the health

region, as well as population immunity in the area. The age groups most affected were 10–14 and 5–9 years, consistent with that report. A key risk factor was CI above 10 in 2013–2015, with larvae found most often in household drinking and domestic water containers. After the measures were implemented, CI fell continuously below 10, consistent with Aree Phumprawai,[10] who found that work must be driven through communities, with volunteers and VHVs as mechanisms, and requires time to build understanding; where cooperation cannot be obtained, action is taken under the Communicable Diseases Act. The below-median case numbers in 2025–2026 are consistent with the national situation in 2025, which was also below the median,[3] so the results should be interpreted in light of natural epidemic cycles.

The developed model used the UCCARE framework together with the EOC and the DHB, with the District Chief Officer as commander, consistent with Noreenee Tawa and Pawit Chaiwisit[8] and Phakaon Chotking and Prachak Buaphan,[9] who found that network-partner and community participation is a key mechanism of disease control. Because Namon was a strong disease-control district in 2017 and passed the national SRRT standard in 2018, placing dengue on the DHB agenda made command, monitoring and local budget support more systematic.[6] Regarding customer focus, communities lacked temephos sand, feared chemicals and applied incorrect doses, and guppies were found not to eat larvae when larvae were abundant; gourami fish were therefore chosen. Although the climbing perch ate the most larvae, it has a strong fishy odor, whereas the gourami is small, hardy and easy to find. This differs from Kongkaew Ya-oop et al.,[11] who found that Nile tilapia ate the most larvae, followed by guppies and climbing perch. Regarding participation, catching gourami fish together was a group activity that fostered cooperation in rural communities. Regarding resource sharing, Namon is a small district with convenient transportation, strong volunteers and VHVs, and local budget support, enabling 100% mobilization during outbreaks.

After implementation, cases in 2016–2018 (21, 36 and 5) decreased overall but not consistently every year, with no deaths. HI/CI fell below 10, and the disease was controlled within the first generation, with no second-generation cases. Satisfaction increased in all domains, especially efficacy compared with temephos sand, cost-effectiveness and participation, and safety, consistent with Aree Phumprawai,[10] because larval control with locally available gourami fish is low-cost, easy to use and can be done by communities themselves, whereas chemical methods require correct application and dosing by volume and may lead to larval resistance. Limitations of this study include a single-district R&D design without a comparison group; pilot and DHB phase data from different periods; retrospective pilot data following a peak epidemic year, which may involve regression to the mean; pre–post measurements in different seasons; measurement of satisfaction with the innovation before its use; some respondents being implementing network partners; and analysis of summary values not adjusted for seasonality. The observed reductions may also

have been influenced by epidemic cycles, so the results should be interpreted with caution.

Conclusion

The dengue problem-solving model through the Namon DHB comprises six UCCARE-based measures driven jointly with the district EOC using a participatory gourami larvivorous fish innovation. Cases in 2025 were below the retrospective median, Aedes larval indices fell below the standard, and satisfaction increased significantly. However, causality cannot be inferred because there was no comparison group in either the pilot phase or the January 2025–April 2026 implementation phase. Implementation requires time to build understanding and coordinate network partners so that communities can control the disease themselves.

Recommendations

1. Recommendations for applying the findings: 1.1 Measures in each area should be implemented intensively and seriously. 1.2 Leadership and community processes influence the solving of dengue problems. 1.3 Network partners and communities are key mechanisms in driving disease prevention and control. 1.4 Communities should have gourami holding ponds; fish caught from nature should be held for 3–5 days before release, and care should be taken that fish do not jump out when containers are full. 1.5 The DHB should keep dengue as a standing agenda item and continuously set subdistrict-level HI/CI indicators.

2. Recommendations for future research: 2.1 Qualitative studies should be conducted alongside evaluation. 2.2 Comparative studies with neighboring districts should be conducted. 2.3 The model and measures should be tested in other areas. 2.4 The relationships between sex, age and education and dengue preventive behaviors should be studied.

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References

1. World Health Organization. Dengue and severe dengue [Internet]. Geneva: World Health Organization; 2025 [cited 2026 Apr 30]. Available from: https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue
2. Bureau of Vector Borne Diseases, Department of Disease Control, Ministry of Public Health. Weekly dengue situation report [Internet]. Bangkok: Ministry of Public Health; 2018 [cited 2018 May 11]. Available from:

https://ddc.moph.go.th/uploads/ckeditor/6f4922f45568161a8cdf4ad2299f6d23/files/Dangue/Situation/2562/DHF%205%20edit.pdf (in Thai)

3. Jujan S, Mahasing C. Situation and trend of dengue in Thailand, 2025 (data as of 19 August 2025). Weekly Epidemiological Surveillance Report [Internet]. 2025 [cited 2026 Apr 30]. Available from: https://he05.tci-thaijo.org/index.php/WESR/article/view/6538 (in Thai)
4. Namon Hospital. Dengue epidemiological situation report. Strategy and Disease Control Unit. Kalasin: Kalasin Provincial Public Health Office; 2015. (in Thai)
5. Thepkhan D, Phanphiphit P. Gourami larvivorous fish innovation for Aedes mosquito control. Uthaiwan Health Promoting Hospital, Lak Liam Subdistrict, Namon District, Kalasin Province; 2015. (in Thai)
6. Office of the Prime Minister. Regulation of the Office of the Prime Minister on area-based quality of life development B.E. 2561. Royal Gazette. 2018 Mar 9;135(Special Issue 54 D). (in Thai)
7. Ministry of Public Health. Percentage of quality District Health Boards (DHB) [Internet]. Nonthaburi: Ministry of Public Health; [cited 2026 Apr 30]. Available from: https://healthkpi.moph.go.th/kpi2/kpi-list/view/?id=770 (in Thai)
8. Tawa N, Chaiwisit P. Development of a participatory model to enhance community capacity for dengue prevention and control in Khreng Subdistrict, Cha-uat District, Nakhon Si Thammarat Province. Faculty of Science and Technology, Nakhon Si Thammarat Rajabhat University; 2018. (in Thai)
9. Chotking P, Buaphan P. Participation in dengue prevention and control of village health volunteers, Samliam Community, Khon Kaen Municipality. J Off Dis Prev Control 7 Khon Kaen. 2017;24(2):29-37. (in Thai)
10. Phumprawai A. Effect of community participation in dengue prevention at the village level. J Health Health Manag. 2019;5(1):43-52. (in Thai)
11. Ya-oop K, Kulhong B, Soonchan P. Effectiveness of fish in feeding on Aedes larvae. J Off Dis Prev Control 6 Khon Kaen. 2015;22(1):49-55. (in Thai)
12. Kongsomboon K. Epidemiological research. Bangkok: Chulalongkorn University; 2014. p. 51-7. (in Thai)
13. Department of Health, Ministry of Public Health. Writing a satisfaction evaluation form [Internet]. Bangkok: Department of Health; [cited 2020 May 11]. Available from: http://person.anamai.moph.go.th/ewt_dl_link.php?nid=1826 (in Thai)
14. Bloom B, Engelhart M, Furst E, Hill W, Krathwohl D. The classification of educational goals. Handbook I: Cognitive domain. 1956. p. 256-62.
15. Songkhasri C. Dengue forecasting model in the area of the Office of Disease Prevention and Control Region 6, Khon Kaen, 2012. J Off Dis Prev Control 6 Khon Kaen. 2012;20(1):65-81. (in Thai)

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RESEARCH ARTICLE

Development of a Health Promotion Model for Buddhist Monks to Prevent Emerging and Re-emerging Infectious Diseases, Mueang District, Kalasin Province

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Abstract

This research and development study aimed to examine the situation, develop, and evaluate a health promotion model for Buddhist monks to prevent emerging and re-emerging infectious diseases in Mueang District, Kalasin Province, Thailand, from January 2024 to March 2026. The evaluation phase used a one-group pretest–posttest design. The sample comprised 356 participants: 86 monks, 26 health personnel, 58 village health volunteers, 46 temple stewards, 38 temple cooks, 74 regular temple visitors, and 28 temple committee members, selected by stratified sampling; outcomes were evaluated in the 86 monks. Instruments included semi-structured interview and focus group guides, questionnaires on health literacy, mental health (TMHI-66), quality of life (WHOQOL-BREF-THAI), and satisfaction. Quantitative data were analyzed using frequency, percentage, mean, standard deviation, and paired t-test; qualitative data were analyzed by content analysis.

The results showed that 34.26% of the monks had contracted COVID-19, 22.65% had a body mass index above the cut-off, and 25.62% had a waist circumference above the cut-off. The developed model comprised three main components and 10 key measures. After implementation, mean scores of the monks increased significantly in all four domains (all $p < .001$): health literacy for COVID-19 prevention (35.42±22.77 to 52.72±28.45, $t = 5.42$), health literacy on diet, emotion, and exercise (32.44±14.76 to 53.44±13.26, $t = 6.27$), mental health (152.23±88.34 to 180.32±92.84, $t = 3.57$), and quality of life (90.22±52.44 to 125.26±56.32, $t = 3.62$). Satisfaction averaged 18.78±8.35 (out of 25). The model may be tested further in areas with similar contexts, integrated with multidisciplinary teams and community networks, using designs with comparison groups.

Keywords: Buddhist monks, health promotion, emerging and re-emerging diseases, health literacy, quality of life

Introduction

Emerging and re-emerging infectious diseases pose a continuing threat to global population health owing to changes in pathogens, population travel and mobility, and environmental change.[1] Coronavirus disease 2019 (COVID-19) is a major example of an emerging disease with worldwide impact; as of March 2026, the World Health Organization reported more than 779 million cumulative confirmed cases and more than 7.1 million deaths.[2] Thailand has recorded more than 4.7 million cumulative cases and more than 34,000 deaths.[2] In addition, re-emerging diseases such as influenza, dengue fever, and measles remain public health problems requiring continuous surveillance, with older adults and people with underlying diseases at risk of severe illness.

Buddhist monks are at risk of respiratory infections because they travel to perform religious ceremonies on invitation and have close contact with laypeople and fellow monks. During the COVID-19 epidemic in Mueang District, Kalasin Province, which has 886 monks, approximately 34% of monks contracted the disease during 2021–2023, according to surveillance data from the Kalasin Provincial Public Health Office. The most common underlying diseases were diabetes and hypertension, and risks from excess body mass index and waist circumference were also found. These may be partly related to the sweet, fatty, and salty food offered by laypeople, as well as to monks' limited health literacy and undesirable health behaviors. A study of monks aged 35 years and over in Chanthaburi Province found a diabetes prevalence of 10.83%,[3] and such chronic diseases are risk factors for severe infectious disease.

Health promotion under the Ottawa Charter emphasizes building healthy public policy, creating supportive environments, strengthening community action, and developing personal skills.[4] Health literacy refers to the cognitive and social skills that enable individuals to access, understand, and use information to take care of their own health.[5,6] Previous health care models for monks include a health education model for monks[7] and the National Health Charter for Buddhist Monks.[8] However, most studies have focused on chronic non-communicable diseases or care for sick monks, and no model yet integrates the prevention of emerging and re-emerging diseases into health promotion for monks through network partner participation in an urban context. Participatory

research and development is an appropriate approach for developing such a model.[9] The researcher previously developed a health promotion model for monks in the post-COVID-19 situation in the same area.[10] The present study builds on that work by extending its scope from COVID-19 prevention to other emerging and re-emerging diseases, involving additional network partners, and systematically evaluating outcomes in health literacy, mental health, and quality of life.

Because monks' health problems are an urgent issue, the researcher developed a health promotion model for monks that respects the monastic disciplinary rules (Dhamma-Vinaya) and builds laypeople's health literacy regarding food offerings, so that monks can be healthy, adopt desirable behaviors, serve as a spiritual refuge for the public, and follow their monastic practices. The conceptual framework applied the Ottawa Charter, the concept of health literacy, and Pender's Health Promotion Model.[11] The independent variable was the 10-measure health promotion model for monks, and the dependent variables were monks' health literacy, mental health, quality of life, and satisfaction (Figure 1). The findings are expected to guide health agencies and network partners in applying the model to prevent emerging and re-emerging diseases in areas with similar contexts.

Research Objectives

1. To examine the situation and problems of health care and the prevention of emerging and re-emerging diseases among monks in Mueang District, Kalasin Province
2. To develop a health promotion model for monks to prevent emerging and re-emerging diseases in Mueang District, Kalasin Province
3. To implement and evaluate the health promotion model for monks to prevent emerging and re-emerging diseases in terms of process (coverage of measures) and outcomes (health literacy, mental health, quality of life, and satisfaction)

Methods

This research and development study was conducted in Mueang District, Kalasin Province, from January 2024 to March 2026, a total of 27 months, in three phases according to the objectives: Phase 1, situation analysis (January–June 2024); Phase 2, model development (July–December 2024); and Phase 3, implementation and evaluation of the model (January–December 2025, a 12-month program, with results summarized and disseminated in January–March 2026). Phase 3 used a one-group pretest–posttest design.

Situation data in Phase 1 were obtained from the Health Data Center (HDC) database of the Kalasin Provincial Public Health Office and annual health check-up results of monks. Details are as follows.

Population

The population comprised 886 monks in Mueang District, Kalasin Province; 26 staff of Kalasin Hospital, private hospitals, and sub-district health promoting hospitals (SHPHs); 2,488 village health volunteers (VHVs); 111 temple stewards; 186 temple cooks; 2,026 regular temple visitors who attended at least three days a week; and 628 temple committee members from 110 temples in Mueang District. Thirty temples covering all sub-districts were purposively selected based on the abbots' willingness to participate. All 26 health staff were included (census).

Sample

The sample size was calculated using Yamane's formula, $n = N/(1+Ne^2)$, with N = 6,351 and e = 0.0515, yielding 356 participants: 86 monks, 26 health staff, 58 VHVs, 46 temple stewards, 38 temple cooks, 74 temple visitors, and 28 temple committee members. Stratified sampling by role in monks' health care was used, with monks, the main target group, forming the largest stratum, and participants within each stratum were randomly selected by drawing lots without replacement. The outcome evaluation in Phase 3 included 86 monks; G*Power 3.1 for a two-tailed paired t-test with an effect size (dz) of 0.35, α = .05, and power of .80 indicated at least 67 monks, increased to 84 to allow for 20% attrition, and 86 monks were therefore enrolled.

Inclusion Criteria

1) Monks who had resided in a temple in Mueang District for at least one year; 2) health staff, VHVs, temple stewards, temple cooks, and temple committee members whose duties involved monks' health care; 3) regular temple visitors who attended at least three days a week; 4) aged 18 years or older; and 5) able to communicate in Thai and willing to participate.

Exclusion Criteria

Severe illness preventing participation in activities. Discontinuation criteria were 1) moving out of the area or leaving the monkhood during the study and 2) requesting withdrawal from the study.

Research Instruments

The instruments comprised 1) the intervention: the 10-measure health promotion model for monks (Table 3) and its operational manual, rated by three experts as highly appropriate and feasible; and 2) data collection instruments: a semi-structured interview guide, a focus group guide, and questionnaires administered before and after implementation in four domains: health literacy for COVID-19 prevention and health literacy on diet, emotion, and exercise,

adapted from the assessment forms of the Health Education Division, Department of Health Service Support (13 items each, 5-point scale, 13–65 points); mental health (Thai Mental Health Indicator, TMHI-66; 66 items, 4-point scale, 66–264 points); and quality of life (WHOQOL-BREF-THAI; 26 items, 5-point scale, 26–130 points); plus a satisfaction questionnaire administered after implementation (maximum 25 points). Content validity was examined by three experts, yielding item IOC values of 0.67–1.00 for the researcher-developed instruments, whereas the TMHI-66 and WHOQOL-BREF-THAI were used in their standard versions without modification. Reliability testing in 30 people with similar characteristics yielded Cronbach's alpha coefficients of 0.85, 0.83, 0.89, 0.87, and 0.81, respectively.

Data Collection

Qualitative data were collected through observation, four focus group discussions of 8–10 participants each, and semi-structured in-depth interviews with 15 purposively selected key informants until data saturation. Sessions were audio-recorded and transcribed, and trustworthiness was ensured by triangulation. Quantitative data were collected before (January 2025) and after implementation (December 2025) by the researcher and two research assistants.

Data Analysis

Data were analyzed using R version 4.4.1 in RStudio. Descriptive statistics included frequency, percentage, mean ($\bar{x}$), and standard deviation (S.D.). Paired t-tests compared pre- and post-implementation scores in the 86 monks after the distribution of differences was checked with the Shapiro–Wilk test (the Wilcoxon signed-rank test was used if non-normal). Mean differences ($\bar{d}$), 95% confidence intervals (95% CI), and effect sizes (Cohen's dz) were reported, and p-values were Bonferroni-adjusted (α = .0125). Only participants with complete data at both time points were analyzed (complete case), and statistical significance was set at .05. Qualitative data were analyzed by content analysis through coding, categorization, and theme summarization; the researcher and two co-researchers analyzed the data independently and reached consensus, and the results were used to define the measures in Phase 2.

Research Ethics

This study was approved by the Human Research Ethics Committee of the Kalasin Provincial Public Health Office (No. KLS.REC 101/2566, dated 15 December 2023). The researcher explained the study objectives and procedures, obtained signed informed consent, kept data confidential, and presented results only in aggregate; participants could withdraw at any time without affecting the

services they received. Consent from monks was obtained in a manner consistent with monastic discipline, with information conveyed through temple stewards or representatives and without documents being handed directly from women to monks.

Results

1. Situation of Health Care Problems among Monks

1.1 Demographic characteristics. Of the 356 participants, most were female (214, 60.11%) and 142 were male (39.89%). By group, monks were the largest (86, 24.16%), followed by temple visitors (74, 20.79%) and VHVs (58, 16.29%). Most were aged 31–40 years (29.21%), followed by 18–30 years (24.72%), with a mean age of 41.40±13.60 years. Most were single (including monks; 58.99%). The most common education was a religious (Dhamma) qualification (24.16%), followed by a bachelor's degree (20.50%), as shown in Table 1.

Table 1 Demographic characteristics of the sample (n = 356)

Variable	Number	Percentage
Sex		
Male	142	39.89
Female	214	60.11
Group		
Monks	86	24.16
Hospital staff	26	7.30
VHVs	58	16.29
Temple stewards	46	12.92
Temple cooks	38	10.67
Temple visitors	74	20.79
Temple committee members	28	7.87
Age (years) ($\bar{x}$±S.D. = 41.40±13.60)		
18–30	88	24.72
31–40	104	29.21
41–50	81	22.75
≥ 51	83	23.31
Marital status		
Single	210	58.99

Variable	Number	Percentage
Married	48	13.48
Widowed	98	27.53
Education level		
No formal education	36	10.11
Primary school	57	16.01
Lower secondary school	58	16.29
Upper secondary/vocational certificate	46	12.92
Bachelor's degree	73	20.50
Religious (Dhamma) qualification	86	24.16

1.2 Situation of health care problems and disease prevention among monks. Data from the 2024 annual health check-up of monks and the HDC database (N = 886) showed that 34.26% of monks had contracted COVID-19, of whom 28.72% were hospitalized, with no deaths or disabilities. Overall, 24.72% were older adults, 16.54% had hypertension, 13.25% had diabetes, 22.42% had fallen in the past year, 22.65% had a body mass index above the cut-off (≥ 23 kg/m²), and 25.62% had a waist circumference above 36 inches, as shown in Table 2. Situation analysis with network partners identified the key problems as travel for religious ceremonies, offerings of sweet, fatty, and salty food, limited health literacy, and lack of isolation space within temples. Qualitative findings revealed three main themes: 1) monks' limited choice of food, as one said, “Whatever the laypeople offer, we must eat; we cannot choose”; 2) laypeople's lack of knowledge about food suitable for monks; and 3) temples' lack of guidelines and space for managing infected monks.

Table 2 Health problems and disease prevention situation among monks (n = 886)

Situation	Percentage
Contracted COVID-19	34.26
Hospitalized due to COVID-19	28.72
Death or disability	0.00
Older adults	24.72
Underlying disease: hypertension	16.54
Underlying disease: diabetes	13.25
History of falls in the past year	22.42

Situation	Percentage
Body mass index (BMI) above cut-off (≥ 23 kg/m²)	22.65
Waist circumference > 36 inches (approx. 91 cm)	25.62
Blood pressure ≥ 140/90 mmHg	13.64
Fasting capillary blood glucose ≥ 126 mg/dL	3.65
Myopia	14.03
Hyperopia	5.42

2. Development of the Health Promotion Model for Monks to Prevent Emerging and Re-emerging Diseases

2.1 Key measures of the model. The researcher developed the model through situation analysis, a literature review, and three solution-seeking meetings with 30 network partners, including monk representatives, health staff, VHVs, temple stewards, temple cooks, and temple committee members. Consensus was reached through group discussion and joint resolution, and the model was reviewed for appropriateness by three experts. The resulting model comprised 10 key measures, as shown in Table 3.

Table 3 Key measures of the health promotion model for monks to prevent emerging and re-emerging diseases

No.	Activity/Content	Tools	Duration	Academic Rationale
1	Training on COVID-19 and on surveillance and infection prevention measures for monks and temple visitors	Teaching media (PowerPoint), knowledge manual	2 hours	Enhance functional and interactive health literacy based on Nutbeam's concept[5]
2	Develop surveillance and prevention guidelines based on DMHTTA measures; manage the temple environment; clean equipment and religious areas daily	Practice guidelines, cleaning solutions	Daily	Create supportive environments for health based on the Ottawa Charter[4]
3	Designate suitable isolation areas within temples according to context	Area assessment form, temple layout	1 day per temple	Separate patients from others to reduce transmission within temples
4	Screen temple visitors at risk of COVID-19	Screening form, thermometer, ATK test kits	Every activity day	Proactively detect patients and risk groups at an early stage

No.	Activity/Content	Tools	Duration	Academic Rationale
5	Health behavior modification for monks on 3E (eating, exercise, emotion) and adequate rest	Lesson plans, health record book	3 hours	Promote perceived self-efficacy based on Pender's Health Promotion Model[11]
6	Public communication via community broadcasting, village loudspeakers, leaflets, video clips, and the hospital page on healthy food offerings that avoid sweet, fatty, and salty food	Broadcasting, leaflets, video clips, hospital page	Ongoing throughout the project	Build health literacy among laypeople who offer food[6]
7	Poster boards on healthy food and chronic diseases within temples	Poster boards	Throughout the project	Provide continuous reminders and knowledge in the temple environment
8	Training on healthy menus for monks to prevent chronic diseases	Healthy menu manual, cooking demonstration	3 hours	Develop the skills of temple cooks and stewards in preparing food offerings
9	Proactive, integrated health check-ups of monks by a multidisciplinary team	Weighing scale, measuring tape, blood pressure monitor, glucometer	Twice a year	Screen for chronic diseases, which are risk factors for severe infection
10	Telemedicine via video call for symptom inquiry, with medication delivered by staff and VHVs	Smartphone, video call	By appointment or when symptomatic	Increase access to services and reduce travel and close contact

2.2 Development process and components of the model. Network partners jointly drove the activities and piloted the model in two temples with 30 participants for one month. The model was then evaluated and refined before full implementation by adjusting training schedules to fit monks' daily routines and simplifying the media. The model has three main components: (1) participation of network partners, including Kalasin Hospital, SHPHs, the Provincial Public Health Office, temples, and VHVs; (2) 10 measures covering the prevention of emerging and re-emerging diseases and the promotion of 3E health behaviors (eating, exercise, and emotion); and (3) continuous monitoring and evaluation by a multidisciplinary team, as shown in Figure 1.

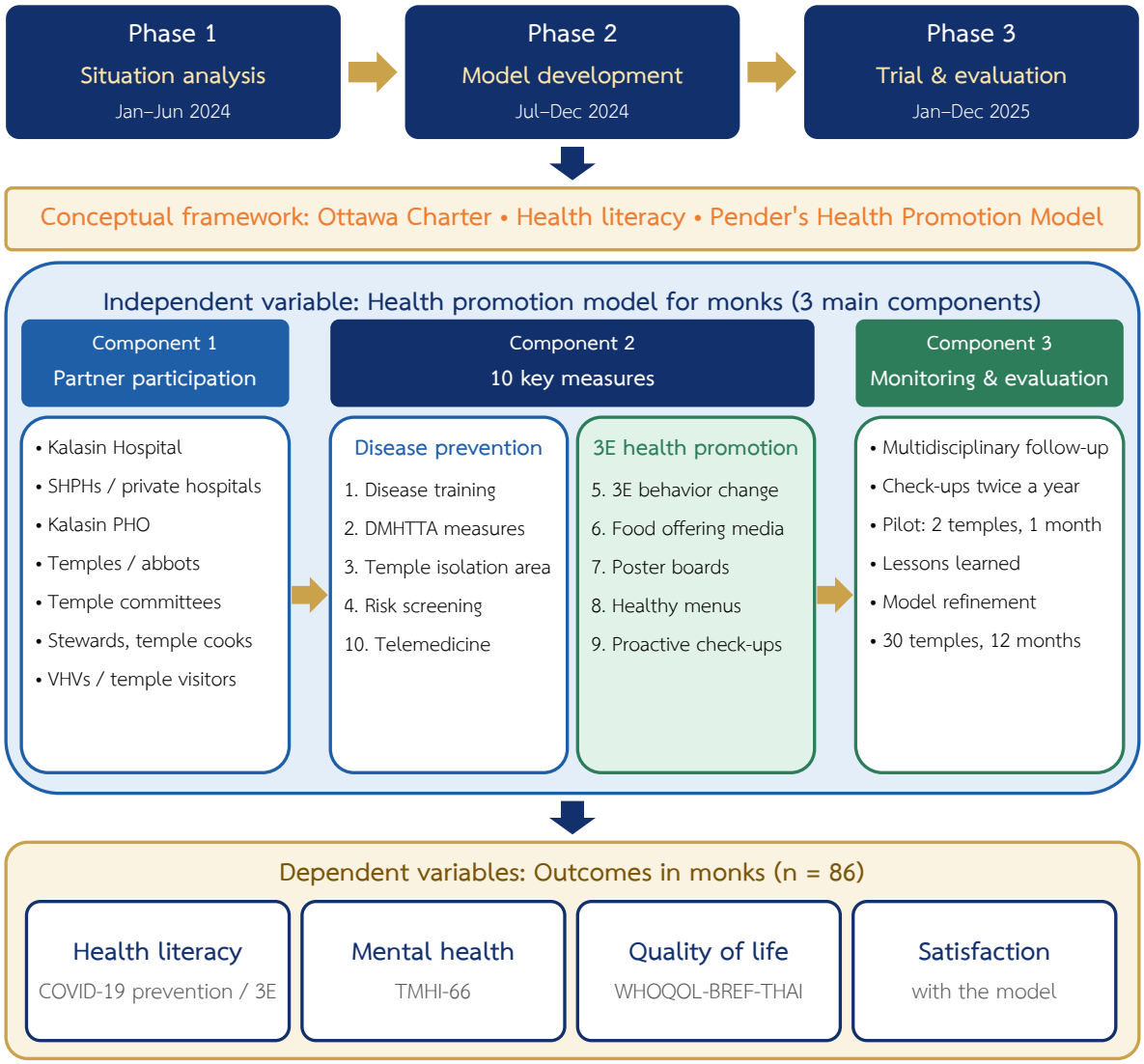

Figure 1 Health promotion model for monks to prevent emerging and re-emerging diseases, Mueang District, Kalasin Province

3. Implementation and Evaluation of the Model

3.1 Implementation results. All 30 participating temples implemented all 10 measures. Of the monks, 93.02% (80 of 86) attended the training; 2,450 risk screenings of temple visitors were conducted; and 124 telemedicine consultations were provided to monks. Post-implementation health check-ups showed that 19.77% had a body mass index above the cut-off, 22.09% had an excess waist circumference, and 11.63% had blood pressure of 140/90 mmHg or higher. Five monks (5.81%) contracted respiratory infections during the implementation period.

3.2 **Comparison of scores before and after implementation.** All 86 monks completed both questionnaires with no attrition. Mean scores after implementation were significantly higher than before in all four domains ($p < .001$), remaining significant after Bonferroni adjustment, with small to

moderate effect sizes (Cohen's dz = 0.38–0.68), as shown in Table 4. Satisfaction with the model, measured after implementation, averaged 18.78±8.35 points (out of 25).

Table 4 Comparison of mean scores before and after implementation of the health promotion model for monks (n = 86)

Variable	Max score	Before		After		$\bar{d}$	95% CI	t	Cohen's dz	p-value
		$\bar{x}$	S.D.	$\bar{x}$	S.D.					
Health literacy for COVID-19 prevention	65	35.42	22.77	52.72	28.45	17.30	10.95–23.65	5.42	0.58	<.001*
Health literacy on diet, emotion, and exercise	65	32.44	14.76	53.44	13.26	21.00	14.34–27.66	6.27	0.68	<.001*
Mental health (TMHI-66)	264	152.23	88.34	180.32	92.84	28.09	12.45–43.73	3.57	0.38	<.001*
Quality of life (WHOQOL-BREF-THAI)	130	90.22	52.44	125.26	56.32	35.04	15.79–54.29	3.62	0.39	<.001*

*Statistically significant at $p < .05$

Discussion

The situation analysis found that 34.26% of monks had contracted COVID-19, which may be related to their practice of traveling for religious ceremonies and close interaction with laypeople and fellow monks. Hypertension (16.54%), diabetes (13.25%), excess body mass index (22.65%), and excess waist circumference (25.62%) were also found, which may be related to offerings of sweet, fatty, and salty food and limited health literacy. The prevalence of diabetes was similar to that reported among monks aged 35 years and over in Chanthaburi Province (10.83%),[3] although definitions and measurement methods may differ. Evidence from other studies indicates that chronic diseases are risk factors for severe infectious disease;[12] therefore, infectious disease prevention should be implemented alongside health promotion.

The health promotion model for monks was derived from problem review, literature review, and joint solution-seeking meetings, resulting in 10 key measures. This is consistent with the Ottawa Charter's emphasis on creating supportive environments and community participation[4] and with the concept of health literacy, which emphasizes accessing, understanding, and using information for self-care.[5,6] It is also in line with the study by Leeyutthanont et al.,[7] in which network partner participation was a key component, and with the direction of the National Health Charter for Buddhist Monks.[8]

After implementation, mean scores for health literacy, mental health, and quality of life were significantly higher than before ($p < .001$), with small to moderate effect sizes (Cohen's dz = 0.38–0.68). This may be related to collaboration among Kalasin Hospital, the community, and the Kalasin Provincial Public Health Office, as well as network partnerships sustained since the COVID-19 epidemic. These results are consistent with the study by Leeyutthanont et al.[7] and the researcher's previous study in the same area.[10] The model may be adapted to prevent other emerging and re-emerging diseases, such as influenza, dengue fever, and measles.

Limitations of this study include 1) the one-group pretest–posttest design without a comparison group, which precludes causal inference and control of external factors, natural change, and testing effects; 2) the evaluation period occurring after the major COVID-19 pandemic; 3) no measurement of disease incidence or preventive behaviors; 4) self-reported scores; 5) clustering of monks within temples; and 6) implementation only in Mueang District, Kalasin Province.

Conclusion

This research and development study produced a health promotion model for monks to prevent emerging and re-emerging diseases in Mueang District, Kalasin Province, comprising three main components and 10 key measures. The situation analysis showed that 34.26% of monks had contracted COVID-19 and had chronic disease risks. After implementation, monks' health literacy, mental health, and quality of life scores increased significantly ($p < .001$); these are preliminary results from a one-group pretest–posttest design.

Recommendations

1. Recommendations for applying the findings: 1) Health service units applying the model in areas with similar contexts should adapt the measures to community lifestyles and staff workloads and implement them for at least 12 months. 2) Activities should be extended to laypeople who offer food and to patients with chronic diseases, with continuous integration with multidisciplinary teams and network partners. 3) Provincial public health offices and related agencies may use the findings to plan monks' health care in accordance with the National Health Charter for Buddhist Monks.

2. Recommendations for future research: Future studies should use quasi-experimental designs with comparison groups, such as a cluster quasi-experimental design at the temple level, in areas with similar contexts, with long-term follow-up, disease incidence or preventive behavior outcomes, and testing of the model for other emerging and re-emerging diseases.

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References

1. Morens DM, Folkers GK, Fauci AS. The challenge of emerging and re-emerging infectious diseases. Nature. 2004;430(6996):242-9.
2. World Health Organization. WHO COVID-19 dashboard [Internet]. Geneva: World Health Organization; 2026 [cited 2026 Mar 15]. Available from: https://data.who.int/dashboards/covid19
3. Kuramasuwan B, Howteerakul N, Suwannapong N, Rawdaree P. Diabetes, impaired fasting glucose, daily life activities, food and beverage consumption among Buddhist monks in Chanthaburi Province, Thailand. Int J Diabetes Dev Ctries. 2013;33(1):23-8.
4. World Health Organization. Ottawa charter for health promotion. Geneva: World Health Organization; 1986.
5. Nutbeam D. Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. Health Promot Int. 2000;15(3):259-67.
6. Sørensen K, Van den Broucke S, Fullam J, Doyle G, Pelikan J, Slonska Z, et al. Health literacy and public health: a systematic review and integration of definitions and models. BMC Public Health. 2012;12:80.
7. Leeyutthanont M, Uraiwan P, Kaewsakulthong J, Saetew P. Development of health education model for monks. The Journal of Boromarajonani College of Nursing, Nakhonratchasima. 2019;25(2):104-17. (in Thai)
8. National Health Commission Office. The National Health Charter for Buddhist Monks, first edition, B.E. 2560. Nonthaburi: National Health Commission Office; 2017. (in Thai)
9. Kemmis S, McTaggart R, Nixon R. The action research planner: doing critical participatory action research. Singapore: Springer; 2014.
10. Wichaiyo S, Chaisongkram S, Noenchat A. Development of a health promotion model for Buddhist monks in the post-COVID-19 situation, Mueang District, Kalasin Province. J Environ Educ Med Health. 2023;8(4):624-9. (in Thai)
11. Pender NJ, Murdaugh CL, Parsons MA. Health promotion in nursing practice. 7th ed. Boston: Pearson; 2015.
12. Guan WJ, Liang WH, Zhao Y, Liang HR, Chen ZS, Li YM, et al. Comorbidity and its impact on 1590 patients with COVID-19 in China: a nationwide analysis. Eur Respir J. 2020;55(5):2000547.

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RESEARCH ARTICLE

Development of an Elderly Care Model during Winter Respiratory Disease Outbreaks in Yang Talat District, Kalasin Province

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Abstract

This research and development study aimed to analyze the situation, develop, and implement an elderly care model during winter respiratory disease outbreaks in Yang Talat District, Kalasin Province, from December 2024 to February 2025. The evaluation phase used a one-group pretest–posttest design. The sample consisted of 45 participants: 15 older adults, 15 network partners, and 15 family caregivers from 15 sub-districts. The instruments were focus group guidelines, semi-structured interviews, a knowledge test, a behavior assessment, and a satisfaction questionnaire. Data were analyzed using descriptive statistics, paired t-test, and content analysis.

Most participants were female (71.11%), and the largest age group was 60 years or over (44.44%). The problems identified were concerns about chronic diseases, lack of caregiving skills and confidence, limited knowledge of nutrition, and respiratory infections during cold weather. The developed model comprised seven measures: surveillance of dangerous diseases, universal prevention (UP-DMHTA) training, vaccination support, an elderly-friendly community environment, a specialist consultation system, community health literacy, and holistic elderly care. After implementation, the mean knowledge score increased from 6.52±2.41 to 8.01±1.56 ($t = 3.52$, $p = 0.001$), the mean behavior score increased from 7.73±3.76 to 9.92±1.76 ($t = 4.53$, $p < 0.001$), and satisfaction averaged 13.33±3.18. The model should be tested further with community networks and family caregivers as the key mechanism, using comparison-group designs.

Keywords: Older adults, Winter season, Respiratory diseases

Introduction

Respiratory infections are a major health threat to older adults worldwide. Seasonal influenza is estimated to be associated with 291,000–646,000 respiratory deaths annually,[1] and approximately two-thirds of seasonal influenza deaths occur among people aged 65 years or over.[2] Thailand has become an aged society. As of June 2023, of a total population of 66.05 million, 12.76 million (19.31%) were older adults,[3] and the 2024 Survey of Older Persons found 14.03 million older adults, or 20.0% of the national population.[4] Older adults in Thailand are classified as socially active (97.6%), homebound (1.3%), and bedridden (1.1%).[4] In July 2022, the coronavirus disease 2019 (COVID-19) outbreak caused 199,694 infections and 14,589 deaths among older adults, even though vaccination coverage in this group reached 74.21%. The Ministry of Public Health therefore adopted a policy of training caregivers, each of whom can care for up to seven older adults in the community, and of developing a long-term care system covering four dimensions (health, social, economic, and environmental) with the participation of families, communities, and local authorities, so that older adults have a good quality of life and can care for themselves in the community.[5]

Kalasin Province has 215,621 older adults, and caregivers trained under the Ministry of Public Health curriculum are available in all 18 districts. However, problems persist, including older adults who depend on others in daily living, a lack of integration across sectors, and a lack of care models and guidelines suited to the caregivers actually working in the area.[6] During winter, older adults with chronic diseases are at risk of severe illness from respiratory infections. In 2024, Thailand recorded 668,027 cumulative influenza cases and 51 deaths, and adults aged 65 years or over are at risk of complications and death.[7] Kalasin Province reported one influenza death in 2024,[8] and during 19–25 January 2025, there were 7,819 influenza cases, 3,884 pneumonia cases, and 779 COVID-19 cases nationwide.[9] Yang Talat District has 22,709 older adults (20.46% of its population), of whom 58.20% are young-old (60–69 years), 31.23% middle-old (70–79 years), and 10.57% oldest-old (80 years or over) (2024 data). Older adults are physically, mentally, and socially vulnerable and require special care and surveillance,[10] particularly from December to February, when the weather is cold and respiratory diseases spread, leading to more influenza and pneumonia cases among older adults, while influenza vaccination coverage among older adults in the area remains incomplete.

Previous studies in neighboring areas suggest that elderly care should be community-based, including health care for older adults with anxiety during the COVID-19 outbreak in Khon Kaen Province,[11] the development of a health care model for caregivers of older adults in Warin Chamrap District, Ubon Ratchathani Province,[12] factors affecting the quality of life of older adults,[13]

and a community-participation model in Maha Sarakham Province.[14] However, there is a lack of studies that develop an elderly care model specifically for winter, when multiple respiratory diseases circulate simultaneously (research gap), within the Isan cultural context and the network partner mechanisms of Yang Talat District.

The researcher therefore developed a health care model for older adults appropriate to Isan culture, drawing on families, communities, and network partners to build sustainable capacity for caring for older adults during winter respiratory disease outbreaks. The resulting model is expected to be used by health service units, local administrative organizations, and network partners to reduce severe illness and hospitalization among older adults.

The conceptual framework applied the concepts of community-based long-term care for older adults and respiratory infection prevention measures as the basis for developing seven measures, which were expected to affect knowledge and health care behaviors for older adults.

Objectives

1. To study the situation and problems of health care for older adults during winter respiratory disease outbreaks in Yang Talat District, Kalasin Province.
2. To develop a health care model for older adults during winter respiratory disease outbreaks in Yang Talat District, Kalasin Province.
3. To implement and evaluate the health care model for older adults during winter respiratory disease outbreaks in Yang Talat District, Kalasin Province, in terms of process and outcomes, namely knowledge, health care behaviors for older adults, and satisfaction.

Methods

This research and development study was conducted in Yang Talat District, Kalasin Province, over three months from December 2024 to February 2025, in three phases: Phase 1, situation analysis (December 2024); Phase 2, model development (late December 2024 to early January 2025); and Phase 3, model implementation and evaluation (January–February 2025), during which the activity program was implemented continuously for four weeks. Phase 3 used a one-group pretest–posttest design. Details are as follows.

Population

The population comprised 624 network partners working with older adults in government agencies and the private sector, 22,709 older adults, and 750 family caregivers residing in Yang Talat District, Kalasin Province, from December 2024 to February 2025.

Sample

The sample size was calculated for comparing pre- and post-test means (paired t-test), with $Z\alpha$ = 1.96 (type I error 5%, 95% confidence), $Z\beta$ = 0.84 (type II error 20%, 80% power), a standard deviation of the differences (σd) of 2.87, and an expected difference (Δ) of 1.20 points, yielding 44.85 participants. A total of 45 participants were therefore included: 15 older adults, 15 network partners, and 15 family caregivers representing 15 sub-districts (three per sub-district). Participants were selected by stratified random sampling by sub-district and group (one per group per sub-district), drawing lots from lists of those meeting the inclusion criteria. One person was selected per household; if the quota was not met, the next household was sampled until the required number was reached. No one declined to participate or was replaced.

Inclusion Criteria

1) Older adults aged 60 years or over who could communicate in Thai; 2) network partners, namely government agencies, community leaders, or village health volunteers (VHVs); 3) relatives or caregivers of older adults in the community with more than three years of caregiving experience; 4) willingness to participate voluntarily; and 5) family caregivers and network partners aged 18 years or over.

Exclusion Criteria

Severe illness preventing participation in activities. Discontinuation criteria were 1) attending less than 80% of all activities and 2) withdrawal from the study; the number of participants who discontinued is reported in the results.

Research Instruments

The instruments comprised 1) the intervention instruments, namely the seven-measure elderly care model (Table 2) and its operations manual, while group processes, community forums, and lessons-learned sessions were the methods used in Phases 1–2; and 2) the data collection instruments: 2.1) an eight-item open-ended focus group guide; 2.2) a 15-item true/false knowledge test on health care for older adults; 2.3) a 14-item, five-point rating scale of health care behaviors for older adults (score range 14–70, calculated as the sum of item scores, covering diet, sleep, exercise, elimination, accident prevention, hygiene, and stress adaptation); and 2.4) an eight-item, five-point rating scale of satisfaction with the model (score range 8–40), administered after implementation. The content was adapted to cover winter respiratory infection prevention. Content validity was examined by three experts, yielding index of item–objective congruence (IOC) values of 0.78 for the focus group guide, 0.82 for the draft model, and 0.88 for the evaluation instruments overall. Reliability was tested with 30 older adults, family caregivers,

and network partners (10 per group) in a neighboring district, yielding a KR-20 of 0.84 for the knowledge test and Cronbach's alpha coefficients of 0.82 for the behavior assessment and 0.86 for the satisfaction questionnaire.

Data Collection

Data were collected in three phases as follows.

Phase 1: Situation analysis (December 2024) Data were collected through focus group discussions and semi-structured in-depth interviews with 45 older adults, network partners and community leaders, and family caregivers representing 15 sub-districts. Focus groups were divided into three groups by informant type (15 per group) and conducted by trained research assistants using the eight-item guide, with audio recording and field notes, until data saturation was reached. Trustworthiness was ensured through data triangulation. Content analysis was used to inform model construction, and the initial draft model comprised four activities.

Phase 2: Model development (late December 2024 to early January 2025). The model was drafted from Phase 1 data together with a review of relevant documents and research, submitted to three experts in elderly care for content validation (IOC = 0.82), and revised according to their suggestions, and the evaluation instruments were developed.

Phase 3: Model implementation and evaluation (January–February 2025). Training sessions following the model activities were held three times within four weeks, each lasting four hours in the afternoon. Knowledge and behaviors were assessed before the activities. Caregivers then provided home-based care to 150 older adults in 15 sub-districts. Knowledge and behaviors were reassessed, and satisfaction was evaluated at the end of week 4 by trained research assistants. Progress was monitored weekly, and lessons learned were summarized at the end of the study (February 2025).

Data Analysis

Data were processed using R version 4.4.1 via RStudio. 1) Descriptive statistics, namely frequency, percentage, mean ($\bar{x}$), and standard deviation (S.D.), were used for sex, age, marital status, and education level. 2) Inferential statistics: paired t-tests compared knowledge and behavior scores before and after implementation, by group (older adults, family caregivers, and network partners) and overall, after the distribution of differences was checked with the Shapiro–Wilk test (the Wilcoxon signed-rank test was used if non-normal). Mean differences ($\bar{d}$), 95% CIs, and Cohen's dz were reported. Score levels were interpreted using Bloom's criteria for knowledge and Best's criteria for behavior and satisfaction. Satisfaction was reported using descriptive statistics. The significance level was set at .05. 3) Qualitative data were analyzed using content analysis.

Research Ethics

This study adhered to the ethical principles of human research. The researcher protected participants' rights, including privacy, confidentiality, and informed consent. Participants were informed of the objectives and procedures and signed consent forms; their data were kept confidential and presented only in aggregate, and they could withdraw at any time without affecting the services they received. To prevent indirect coercion, the researcher, a provincial-level administrator, did not recruit participants or collect data directly.

Results

1. Situation of Elderly Care

1.1 General characteristics of the sample Most participants were female (n = 32, 71.11%). Older adults, network partners, and family caregivers each accounted for 15 participants (33.33%). The largest age group was 60 years or over (n = 20, 44.44%), followed by 21–25 years (n = 7, 15.56%) and 31–35 years (n = 4, 8.89%). Most were single (n = 18, 40.00%), followed by married/cohabiting (n = 12, 26.67%) and other (divorced/separated/not specified) (n = 10, 22.22%). The most common education level was a bachelor's degree (n = 22, 48.89%), followed by no formal education (n = 10, 22.22%) and lower secondary school (n = 5, 11.11%), as shown in Table 1.

Table 1 General characteristics of the sample (n = 45)

Variable	Number	Percentage
Sex		
Male	13	28.89
Female	32	71.11
Participant group		
Older adults	15	33.33
Family caregivers	15	33.33
Network partners	15	33.33
Age (years)		
18–20	2	4.44
21–25	7	15.56
26–30	3	6.67

Variable	Number	Percentage
31–35	4	8.89
36–40	4	8.89
41–45	2	4.44
46–50	2	4.44
51–59	1	2.22
60 or over	20	44.44
Marital status		
Single	18	40.00
Married/cohabiting	12	26.67
Widowed	5	11.11
Other (divorced/separated/not specified)	10	22.22
Education level		
No formal education	10	22.22
Primary school	4	8.89
Lower secondary school	5	11.11
Upper secondary/vocational certificate	4	8.89
Bachelor's degree	22	48.89

1.2 Problems in elderly care Content analysis of data from older adults, community network partners, and family caregivers showed that informants in Yang Talat District were concerned about managing incurable chronic diseases, felt they lacked caregiving skills and confidence, wanted support from the government and professional care teams, needed knowledge about nutrition, and were worried about winter respiratory infections such as influenza, pneumonia, and COVID-19, as well as protection from the cold and older adults' access to vaccines. Four main themes emerged: 1) concern about incurable chronic diseases, mainly among older adults; 2) lack of caregiving skills and confidence, mainly among family caregivers; 3) need for support from the government and multidisciplinary teams, mainly among network partners; and 4) concern about winter respiratory infections and vaccine access, across all groups.

2. Model Development

2.1 Development process The researcher developed the model through activity design, joint identification of development issues, implementation, and evaluation. The initial draft comprised

four activities: 1) surveillance of older adults for dangerous diseases; 2) creating an elderly-friendly community environment; 3) strengthening the elderly care and medical consultation system; and 4) encouraging VHVs, caregivers, and community members to provide holistic care for older adults. After expert review and lessons-learned sessions, the draft was refined into seven measures before implementation in Phase 3, as shown in Table 2 and Figure 1.

Table 2 Elderly care model during winter respiratory disease outbreaks (seven measures)

Week	Activity/content	Tools	Duration	Rationale
1–4	1) Surveillance of older adults for dangerous diseases, e.g., stroke, cardiovascular disease, falls, and respiratory infections (influenza, pneumonia, COVID-19)	Risk screening form, thermometer, pulse oximeter	Weekly home visits for 4 weeks	Older adults have declining immunity and comorbidities; active surveillance enables early detection and referral
1	2) Training in Universal Prevention with D-M-H-T-A (UP-DMHTA) for older adults, caregivers, and household members; older adults wear masks at all times (distancing, masking, handwashing, screening, application use)	Manual, videos, face masks, alcohol gel	4 hours (afternoon)	Respiratory diseases spread via droplets; Universal Prevention reduces household transmission
2	3) Supporting influenza and COVID-19 vaccination for older adults	Registry of high-risk older adults, vaccination appointment cards	Throughout the project	Vaccines reduce severity and death among older adults and people with underlying diseases, who are at high risk
2–3	4) Creating an elderly-friendly community environment per the Department of Health's COVID Free Setting standard on the Thai Stop Covid Plus platform, and keeping homes warm, ventilated, and dust-free	Environmental checklist	4 hours (afternoon)	A suitable environment reduces the risk of infection and falls

Week	Activity/content	Tools	Duration	Rationale
3	5) Strengthening the elderly care system and specialist consultation when older patients with respiratory infections or COVID-19 are admitted to Yang Talat Hospital	Consultation channels (telephone/LINE group), referral guidelines	Throughout the project	Rapid access to medical consultation and referral reduces severity and complications
3–4	6) Building health literacy among the general public on winter respiratory infections and COVID-19, with over 80% meeting Universal Prevention criteria	Public relations media, village broadcasts, community forums	4 hours (afternoon)	Health literacy helps people make correct decisions and practices to prevent disease
4	7) Encouraging staff, VHVs, caregivers, and community members to provide holistic care: no falls, no forgetting, no depression, and good appetite	Holistic care manual, weekly follow-up form	Ongoing, with lessons learned at the end of week 4	Integrated physical, mental, and social care improves quality of life and reduces depression

2.2 Expert validation The three experts considered the model's content and language easy to understand, useful, and practical, with an IOC of 0.82 for the draft model. They considered that the model could be applied in districts with similar contexts. Success factors included a community-centered approach, support from the district chief officer and community leaders, and the mechanism of relatives and caregivers in the community.

3. Model Implementation

3.1 Implementation outputs Caregivers visited 150 older adults at home in 15 sub-districts. Influenza vaccination coverage among high-risk older adults reached 80.00%, specialists were consulted 12 times, and no participants discontinued the study.

3.2 Knowledge and health care behaviors for older adults After implementation, the mean knowledge score increased significantly from 6.52±2.41 to 8.01±1.56 ($t = 3.52$, $p = 0.001$), and the mean behavior score increased significantly from 7.73±3.76 to 9.92±1.76 ($t = 4.53$, $p < 0.001$), as shown in Table 3.

Table 3 Comparison of mean knowledge and behavior scores before and after implementation (paired t-test, n = 45)

Variable	Group	Before		After		Level	d̄	95%CI	t	p-value
		$\bar{x}$	S.D.	$\bar{x}$	S.D.					
1. Knowledge (full score 15)	Overall (n = 45)	6.52	2.41	8.01	1.56	Moderate/High	1.49	0.64–2.34	3.52	0.001*
2. Behavior (full score 70)	Overall (n = 45)	7.73	3.76	9.92	1.76†	Low/High	2.19†	1.22–3.16†	4.53	<0.001*

*Statistically significant at p-value <.05

†$\bar{d}$ and 95% CI were calculated from the reported t statistics

3.3 Satisfaction with the model After implementation, the mean satisfaction score was 13.33±3.18 (moderate level).

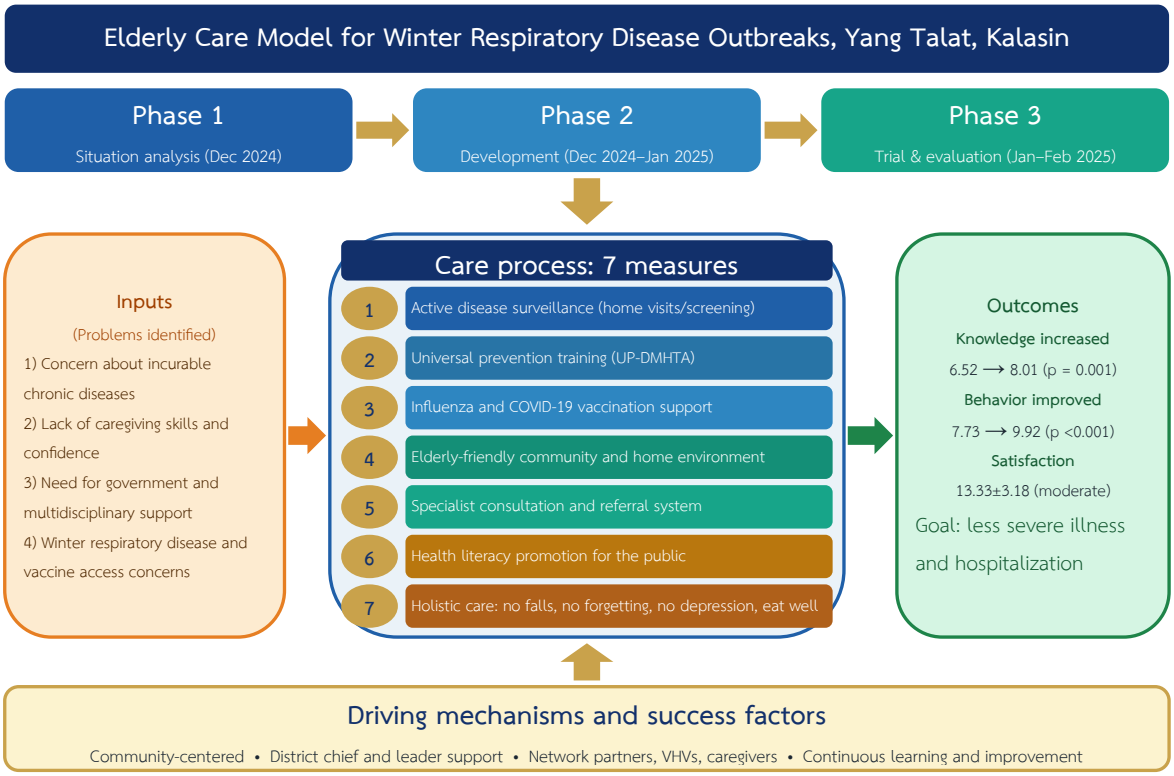

Figure 1 Diagram of the elderly care model during winter respiratory disease outbreaks, Yang Talat District, Kalasin Province

Discussion

Situation and problems. Most participants were female, and the largest age group was 60 years or over. They were worried about caring for chronic diseases, particularly because these diseases cannot be cured, felt that they lacked caregiving skills and

confidence, wanted support from the government and professional care teams, needed knowledge about nutrition, and were concerned about winter respiratory infections and COVID-19. Chronic diseases are a common problem in older age; they cause physical discomfort, lead to disability, require regular medical visits, and place older adults at risk of death from respiratory infections, consistent with evidence that adults aged 65 years or over are at risk of influenza complications.[2,7] Meanwhile, caregivers and community members were anxious, lacked caregiving skills, and did not consider themselves professionals. The government should therefore support regular intensive training to build the confidence of caregivers and community members alike. This is in line with the study by Chomphuphan et al. on the effects of new-normal health care for older adults with anxiety during the COVID-19 outbreak in Khon Kaen Province.[11]

Model development. The four initial activities were not sufficiently comprehensive, were not community-centered, and relied mainly on public health personnel, similar to the findings of Robrujen.[12] After refinement into seven measures with the addition of winter respiratory infection prevention measures, namely UP-DMHTA training, vaccination support, and health literacy promotion, the model may be applicable in districts with similar contexts because it is community-centered, strong district chief officers and community leaders helped drive the measures, and the mechanism of relatives and caregivers, with close family and community ties, supported implementation. This is consistent with the study by Daharn and Daoraj, who developed a community-participation health care model for older adults in Maha Sarakham Province.[14]

Model implementation. Mean knowledge and behavior scores increased significantly, which may be related to a development process that relied on community leaders, VHVs, and network partners from within the community. However, a one-group pretest–posttest design cannot establish causality. Satisfaction after implementation was moderate; older adults with chronic illnesses may experience accumulated stress, so mental health care should also be considered, consistent with the study by Samsuad on factors affecting the quality of life of older adults.[13] This study has limitations. Follow-up lasted only three months during a single winter season, the sample was small (45 participants), and there was no comparison group, so causal conclusions and generalization to other areas are limited; moreover, the incidence of respiratory illness was not directly assessed. In addition, the same participants took part in problem analysis, development, and evaluation; pooling three groups with different roles may mask group differences; and post-test scores may have been influenced by repeated testing.

Conclusion

Most participants were female, and the largest age group was 60 years or over. They were concerned about chronic diseases, lack of caregiving skills and confidence, nutrition knowledge, and winter respiratory infections. The developed elderly care model comprised seven measures: 1) surveillance of dangerous diseases; 2) UP-DMHTA training; 3) vaccination support; 4) an appropriate community environment; 5) a specialist consultation system; 6) health literacy promotion; and 7) holistic care promotion. After implementation, mean knowledge ($t = 3.52$, $p = 0.001$) and behavior ($t = 4.53$, $p < 0.001$) scores increased significantly, and satisfaction after implementation was moderate. These are preliminary findings from a one-group pretest–posttest design.

Recommendations

1. Recommendations for applying the findings The seven-measure model may be tested in districts with similar contexts by supporting training for both community members and family caregivers to build skills and confidence, using community network partners and family caregivers as key mechanisms, adding mental health care for older adults with chronic diseases, and starting the measures before winter, around October–November, particularly vaccination and screening of high-risk groups.

2. Recommendations for future research Future studies should use a quasi-experimental design with a comparison group, a larger sample, and follow-up throughout the season, and should evaluate clinical outcomes such as morbidity, hospitalization for respiratory diseases, and the cost-effectiveness of the model. Results should also be analyzed by group, using evaluation samples that did not take part in model development.

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References

1. Iuliano AD, Roguski KM, Chang HH, Muscatello DJ, Palekar R, Tempia S, et al. Estimates of global seasonal influenza-associated respiratory mortality: a modelling study. Lancet. 2018;391(10127):1285-300.

2. Paget J, Spreeuwenberg P, Charu V, Taylor RJ, Iuliano AD, Bresee J, et al. Global mortality associated with seasonal influenza epidemics: new burden estimates and predictors from the GLaMOR Project. J Glob Health. 2019;9(2):020421.

3. Department of Health, Ministry of Public Health. Situation of the elderly population in Thailand [Internet]. Nonthaburi: Department of Health; 2023 [cited 2025 Feb 15]. Available from: https://eh.anamai.moph.go.th/th/cms-of-23/download/?did=214511&id=109527 (in Thai)

4. National Statistical Office. The 2024 survey of the older persons in Thailand [Internet]. Bangkok: National Statistical Office; 2024 [cited 2025 Feb 15]. Available from: https://www.nso.go.th/nsoweb/storage/survey_detail/2025/20241003145311_94190.pdf (in Thai)

5. Foundation of Thai Gerontology Research and Development Institute. Situation of the Thai elderly 2015. Bangkok: Amarin Printing & Publishing; 2015. (in Thai)

6. Kalasin Provincial Public Health Office. Annual report. Kalasin: Kalasin Provincial Public Health Office; 2021. (in Thai)

7. Department of Disease Control, Ministry of Public Health. DDC reports rising influenza situation and recommends vaccination [Internet]. Nonthaburi: Department of Disease Control; 2025 [cited 2025 Feb 15]. Available from: https://ddc.moph.go.th/brc/news.php?news=50441&deptcode=brc&news_views=4494 (in Thai)

8. PPTV HD36. Influenza situation 2024: 51 deaths, mostly influenza A [Internet]. Bangkok: PPTV HD36; 2025 [cited 2025 Feb 15]. Available from: https://www.pptvhd36.com/health/news/6503 (in Thai)

9. JS100. Influenza cases in Thailand, 19–25 January 2025 [Internet]. Bangkok: JS100; 2025 [cited 2025 Feb 15]. Available from: https://www.js100.com/en/site/news/view/148202 (in Thai)

10. Yang Talat District Health Office. Summary report of focus group discussions for the development of elderly care. Kalasin: Yang Talat District Health Office; 2021. (in Thai)

11. Chomphuphan W, Chomphuphan W, Sridaket S, Kechit T, Ungpinitpong W, Srikongpli W. Effects of health care for older adults with new-normal anxiety during the COVID-19 pandemic in Khon Kaen Province. Journal of Health Science Research. 2021;15(1):81-92. (in Thai)

12. Robrujen S. Development of a health care model for older adults for caregivers in Warin Chamrap District, Ubon Ratchathani Province. Princess of Naradhiwas University Journal. 2017;9(3):57-70. (in Thai)

13. Samsuad K. Factors affecting quality of life of older adults in the eastern provinces. Community Research Journal. 2017;11(2):21-37. (in Thai)

14. Daharn T, Daoraj J. Development of a community-participation health care model for older adults, Nong Lek Subdistrict, Kosum Phisai District, Maha Sarakham Province. Maha Sarakham Provincial Public Health Office Academic Journal. 2017;2(3):42-52. (in Thai)

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RESEARCH ARTICLE

Development of a Care System for Patients with Communicable Respiratory Diseases in the Inpatient Department, Namon Hospital, Kalasin Province

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Abstract

This research and development study, using a two-group pretest–posttest design in the evaluation phase, aimed to examine the situation, develop a care system for patients with communicable respiratory diseases in the inpatient department, and evaluate its effects on the knowledge and practice of healthcare personnel. The study was conducted at Namon Hospital, Kalasin Province, from January 2024 to December 2025. The sample consisted of healthcare personnel caring for patients, 29 in the experimental group and 29 in the control group (58 in total) from Namon Hospital and one neighboring community hospital, respectively, selected by purposive sampling and matched by position and work experience. The research instruments were the care system for patients with communicable respiratory diseases with an 8-week competency development program, a knowledge test, a practice assessment, and a personal protective equipment (PPE) donning and doffing demonstration checklist (KR-20 = 0.81, Cronbach's alpha = 0.86). Data were analyzed using descriptive statistics, paired t-test, independent t-test, chi-square test, and ANCOVA.

After implementation, the experimental group had a mean knowledge score of 17.62±1.55, significantly higher than at baseline (11.45±2.18; $t = 16.38$, $p < 0.001$) and higher than the control group (12.14±2.27; $t = 10.74$, $p < 0.001$). The mean practice score of the experimental group was 45.07±3.02, higher than that of the control group (34.83±4.51; $t = 10.16$, $p < 0.001$). Good practice was found in 96.55% of the experimental group compared with 20.69% of the control group ($\chi^2 = 34.40$, $p < 0.001$), and the PPE demonstration pass rates were 93.10% and 55.17%, respectively ($\chi^2 = 10.88$, $p = 0.001$). Thus, knowledge and practice scores of the experimental group were higher than those of the control group after implementation. The system may be used continuously and tested further in community hospitals with similar contexts, including patient outcomes.

Keywords: Communicable respiratory diseases, Inpatient department, Infection prevention and control

Introduction

Communicable respiratory diseases, including coronavirus disease 2019 (COVID-19), influenza, and pneumonia, are major global public health problems. Patients present with fever, cough, and dyspnea and may develop severe complications or die. As of April 2022, the COVID-19 pandemic had caused 511,536,014 cumulative cases worldwide, with 464,778,834 recoveries and 6,253,427 deaths, while Thailand had 4,262,909 cumulative cases, 4,092,878 recoveries, and 28,617 deaths.[1] Although the severity of COVID-19 has declined, non-COVID-19 lower respiratory infections remain a major disease burden; the global mortality rate decreased from 56.5 to 32.9 per 100,000 population between 1990 and 2019, and *Streptococcus pneumoniae* was the leading cause of morbidity and mortality.[2] In 2021, approximately 2.18 million deaths worldwide were attributed to these infections (27.7 per 100,000 population).[2] In Thailand, from 1 January to 24 February 2025, there were 131,826 cumulative influenza cases and 12 deaths, and the Department of Disease Control projected approximately 903,446 cases for the whole of 2025.[3]

As of early May 2022, Kalasin Province had 75,453 cumulative COVID-19 cases, 69,011 recoveries, and 194 deaths.[4] Namon District had 219 confirmed cases distributed across Nong Bua, Namon, Song Plueai, Lak Liam, and Yot Kaeng subdistricts. Namon Hospital is a 30-bed hospital that admits patients with all conditions 24 hours a day. Between July 2021 and May 2022, 515 COVID-19 patients were admitted and 4 died; the inpatient department therefore established a cohort ward in 2021–2022. In 2023, 312 patients with communicable respiratory diseases (influenza, pneumonia, COVID-19, and pulmonary tuberculosis) were admitted to the inpatient department, accounting for 21.40% of all inpatients (1,458). The problems identified were limited staff, a service area close to the general ward building that made isolation difficult, potentially insufficient personal protective equipment, and the inability to determine patients' risk levels before examination, all of which placed personnel at risk of infection. In 2023, four inpatient personnel acquired occupational respiratory infections, and the ward's compliance with infection prevention and control practices was 66.50%, below the target of 80%.

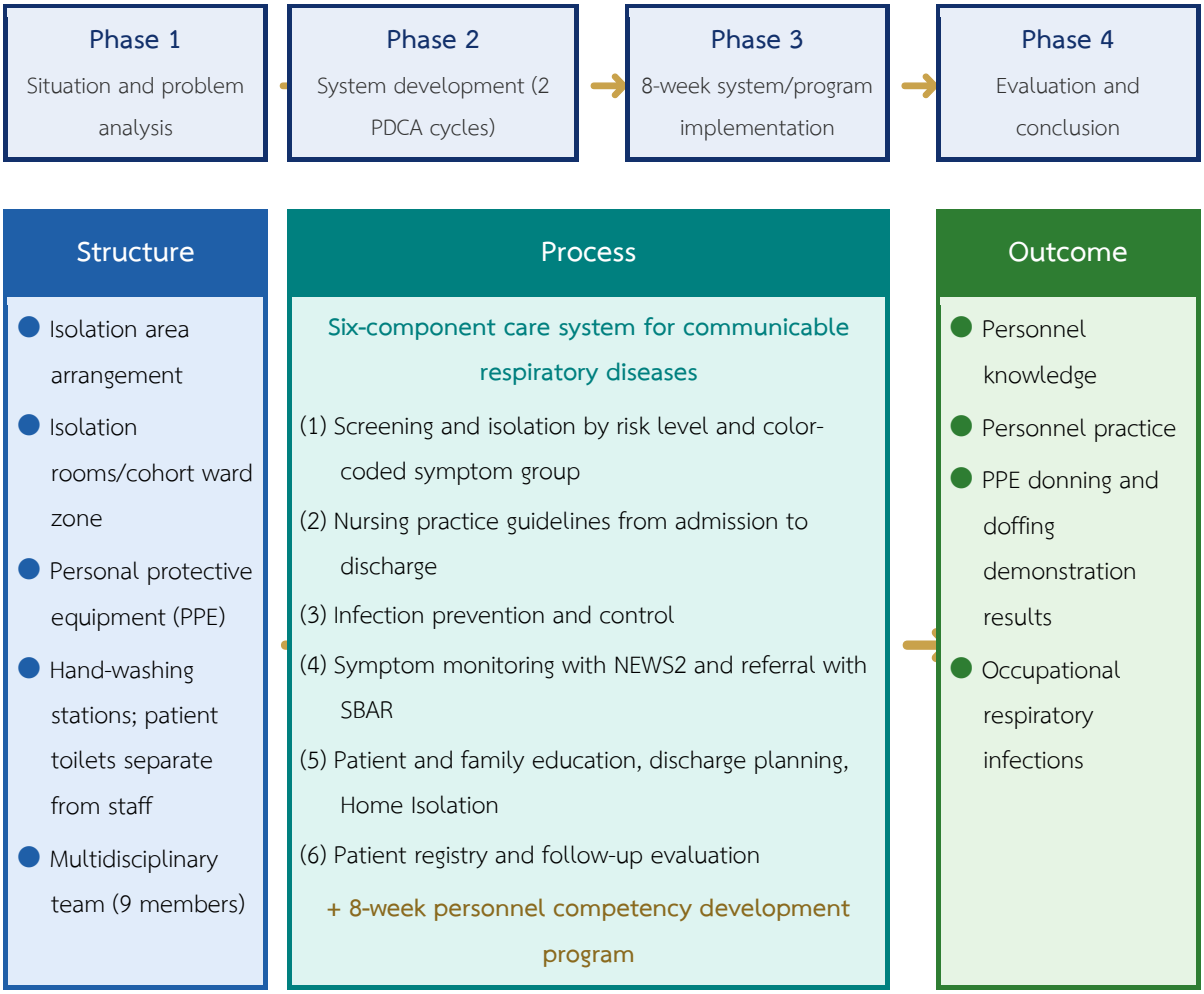
Care of patients with communicable respiratory diseases in the inpatient department requires infection prevention and control, including standard precautions; contact, droplet, and airborne precautions; and isolation rooms,[5,6] together with assessment of clinical deterioration using the National Early Warning Score 2 (NEWS2)[7] and handover communication using SBAR (Situation, Background, Assessment, Recommendation).[8] The researcher applied Donabedian's quality-of-care framework of structure, process, and outcome[9] to develop the system, together with the Department of Medical Services Home Isolation guideline[10] (revised 4 January 2022), adapted to the reclassification of COVID-19 as a communicable disease under surveillance from 1 October 2022. However, most studies have focused on respiratory clinics or COVID-19 care, and few have developed a system covering multiple communicable respiratory diseases in the inpatient departments of small community hospitals, which represents a knowledge gap. For example, the respiratory

infection care system developed at Pho Chai Hospital, Roi Et Province, was implemented in the emergency department and focused on severity triage using the SIRS criteria and SOS score, without covering inpatient care.[11]

As the epidemic has become less severe and controllable, there is an opportunity to develop a clear and sustainable care system for patients with communicable respiratory diseases in the inpatient department, so that patients receive correct, high-quality care and timely referral, and transmission to personnel, other patients, relatives, and visitors is prevented. The findings are expected to serve as a model for other community hospitals.

Conceptual framework The study applied Donabedian's quality-of-care framework: structure, comprising isolation areas and protective equipment; process, comprising the six-component system and the 8-week personnel competency development program; and outcome, comprising personnel knowledge and practice, as shown in Figure 1.

Figure 1 Conceptual framework and model of the care system for patients with communicable respiratory diseases in the inpatient department



Feedback from outcomes ⟶ continuous review and system improvement through the PDCA cycle

Donabedian's quality-of-care framework: Structure ⟶ Process ⟶ Outcome

Research Objectives

1. To examine the situation and problems in caring for patients with communicable respiratory diseases in the inpatient department of Namon Hospital
2. To develop a care system for patients with communicable respiratory diseases in the inpatient department of Namon Hospital
3. To evaluate the effects of the developed system on personnel knowledge and practice, comparing before and after implementation and between the experimental and control groups

Methods

This research and development study used a quasi-experimental two-group pretest–posttest design in the evaluation phase. It was conducted in the inpatient department of Namon Hospital, Kalasin Province, from January 2024 to December 2025 in four phases. Phase 1, situation and problem analysis (January–March 2024), comprised a review of medical records of patients with communicable respiratory diseases and incident reports from 2023, a focus group with 12 inpatient personnel, and interviews with 2 nursing administrators; quantitative data were analyzed using descriptive statistics and qualitative data using content analysis. Phase 2, system development and quality verification (April–September 2024), was carried out by a 9-member multidisciplinary team (1 physician, 5 registered nurses, 1 infection control nurse, 1 pharmacist, and 1 medical technologist) through two PDCA cycles. Phase 3 was system implementation: the experimental group attended an 8-week competency development program (October–November 2024), outcomes were measured after the program in week 9 (December 2024), and the system was used continuously until September 2025. Phase 4 was evaluation and conclusion (October–December 2025). Details are as follows.

Population

The population comprised 36 personnel providing patient care in the inpatient department of Namon Hospital, Kalasin Province, and 38 personnel providing patient care in the inpatient department of one 30-bed community hospital with a similar context in Kalasin Province in 2024. The control hospital was selected on the following criteria: a 30-bed community hospital in the same province with similar staffing and patient characteristics, no specific care system for patients with communicable respiratory diseases, and a location approximately 45 kilometers from Namon Hospital with no shared staff rotation, to prevent contamination of the intervention.

Sample

The sample size was calculated using G*Power for a two-tailed independent t-test with an effect size of 0.80, considered large according to Cohen's criteria,[12] a significance level of 0.05, and a power of 0.80, yielding 26 participants per group. With an additional 10% to allow for attrition, 29 participants per group were required, for a total of 58.[13] Purposive sampling was used: the experimental group consisted of inpatient personnel at Namon Hospital and the control group of personnel at the neighboring community hospital, with frequency matching by position and work experience. Of the 36 personnel in the experimental hospital, 4 did not meet the inclusion criteria (less than 6 months of work) and 3 declined to participate, resulting in a sample of 29.

Inclusion Criteria

1) Registered nurses, technical nurses, practical nurses, nursing assistants, or other personnel providing patient care in the inpatient department; 2) at least 6 months of work in the inpatient department; and 3) voluntary consent to participate in the study.

Exclusion Criteria

Personnel planning study leave or transfer during the study period were excluded. Discontinuation criteria were 1) study leave, sick leave, or transfer during the study; 2) participation in less than 80% of all activities (experimental group); and 3) withdrawal from the study. The number of discontinued participants was reported in the results.

Research Instruments

The instruments comprised 1) the experimental instrument, i.e., the care system for patients with communicable respiratory diseases in the inpatient department, consisting of patient screening and isolation, nursing practice guidelines, infection prevention and control, symptom monitoring and referral, patient and family education, and follow-up evaluation, together with an 8-week personnel competency development program; and 2) data collection instruments: (1) a demographic questionnaire; (2) a 20-item knowledge test (1 point for a correct answer, 0 for an incorrect answer); (3) a 10-item practice assessment rated by observation on a 5-point rating scale, with total scores of 10–50 and a score of ≥80% (40 points) indicating good practice; and (4) a personal protective equipment (PPE) donning and doffing demonstration checklist rated as pass/fail. Content validity was examined by 3 experts, yielding IOC values of 0.67–1.00 and a content validity index (CVI) of 0.92 (S-CVI/Ave). The instruments were tried out with 30 personnel who were not in the sample, yielding a Kuder–Richardson 20 (KR-20) coefficient of 0.81 for the knowledge test and a Cronbach's alpha of 0.86 for the practice assessment.

Data Collection

After obtaining ethics approval and permission from hospital administrators, the researcher explained the study objectives and obtained consent. Pretest data (week 0) were collected using the demographic questionnaire, knowledge test, and practice assessment. The experimental group participated in the program according to the developed system, whereas the control group continued routine practice and received the manual and program training after the study ended. Posttest data (week 9) were collected using the same instruments and the PPE demonstration checklist by infection control nurse assessors who had been briefed on the criteria and were unaware of participants' group

allocation. The assessors did not serve as coaches in week 7, and the forms used codes instead of names; however, because the two groups were in different hospitals, complete blinding was not possible.

Data Analysis

Demographic data were analyzed using descriptive statistics, including frequency, percentage, mean, and standard deviation. Within-group pretest and posttest mean scores were compared using the paired t-test, and between-group comparisons were made using the independent t-test and analysis of covariance (ANCOVA) adjusted for pretest scores, reporting mean differences, 95% CIs, and effect sizes (Cohen's d) after testing for normality and homogeneity of variance (Levene's test). Categorical variables were compared using Pearson's chi-square test or Fisher's exact test when expected frequencies were less than 5. Statistical significance was set at .05.

Ethical Considerations

This study complied with the principles of human research ethics and was approved by the Kalasin Provincial Public Health Office (No. KLS.REC 105/2566, dated 25 December 2023), with permission from the director of the control hospital. The researcher explained the objectives, procedures, and benefits of the study to the participants, who signed voluntary informed consent forms. Data were kept confidential and reported in aggregate, and participants could withdraw from the study at any time without any effect on their work.

Results

1. Situation and Problems in Caring for Patients with Communicable Respiratory Diseases in the Inpatient Department

1.1 General characteristics of the sample The 58 participants were divided into experimental and control groups of 29 each. Most were female (89.66% and 86.21%, respectively), with mean ages of 38.62±7.45 and 37.90±8.12 years; 41.38% and 44.83% were registered nurses, and mean work experience was 11.24±6.38 and 10.76±6.91 years, respectively. General characteristics did not differ between the groups ($p > 0.05$), including sex (Fisher's exact test, $p = 1.000$), age ($t = 0.35$, $p = 0.726$), proportion of registered nurses ($\chi^2 = 0.07$, $p = 0.791$), and work experience ($t = 0.27$, $p = 0.784$). No participants discontinued the study.

1.2 Situation and problems in the inpatient department Data on patients with communicable respiratory diseases in the inpatient department are presented in the Introduction. The situation analysis, based on medical record reviews, incident reports, and a focus group with 12 personnel analyzed using content analysis, identified five main problems: 1) inability to determine patients' risk levels in advance during screening; 2) potentially insufficient personal protective equipment; 3) limited staffing on some days; 4) a service area close to the general ward building, making isolation difficult; and 5) lack of awareness among patients and relatives of person-to-person transmission.

2. Development of the Care System for Patients with Communicable Respiratory Diseases in the Inpatient Department

2.1 The developed system The researcher and the 9-member multidisciplinary team worked through two PDCA cycles comprising briefing meetings and risk identification, development of nursing practice guidelines, personnel training, root cause analysis and correction, evaluation, and review for further improvement. Cycle 1 developed the practice guidelines and patient isolation flowchart; cycle 2 revised the screening form, added a PPE donning and doffing checklist, and revised the criteria for reporting to physicians based on NEWS2 scores. The resulting system consisted of six components: (1) screening and isolation of patients by risk level and color-coded symptom group (green, yellow, red) using isolation rooms or a cohort ward zone; (2) nursing practice guidelines from admission to discharge; (3) infection prevention and control, including risk-based PPE use, hand-washing stations, and patient toilets separate from staff; (4) monitoring of deterioration using NEWS2 and referral using SBAR; (5) patient and family education, discharge planning, and home care (Home Isolation); and (6) patient registry and follow-up evaluation (Figure 1), supported by an 8-week personnel competency development program, as shown in Table 1.

Table 1 Activities of the personnel competency development program based on the care system for patients with communicable respiratory diseases in the inpatient department

Week	Activities/Content	Tools	Duration	Rationale
1	Program orientation, pretest, and education on communicable respiratory diseases (COVID-19, influenza, pneumonia): transmission, symptoms, and treatment	Lecture slides, knowledge test, practice assessment	90 min	Baseline measurement for comparison and linking knowledge to participants' prior experience
2	Infection prevention and control: hand hygiene and PPE donning and doffing, with demonstration and simulation practice	Full PPE sets, PPE donning and doffing checklist	120 min	Standard, contact, droplet, and airborne precautions reduce transmission[5,6]

Week	Activities/Content	Tools	Duration	Rationale
3	Screening and isolation by risk level and color-coded symptom group, use of isolation rooms and cohort ward zones, and patient registry	Admission flowchart, zone signage, patient registry form	90 min	Risk-based isolation from admission reduces exposure of personnel and other patients[5,6]
4	Nursing practice guidelines from admission to discharge, monitoring with NEWS2, and oxygen therapy care	Nursing practice guidelines, NEWS2 record form	120 min	NEWS2 enables early detection of deterioration and timely referral decisions[7]
5	Referral of severely ill patients using SBAR, practiced with case studies	SBAR form, case studies	90 min	Structured communication ensures complete and rapid handover[8]
6	Patient and family education, discharge planning, and home care (Home Isolation)	Educational brochures, Home Isolation guideline	90 min	Patients and relatives practice correctly, reducing transmission to families and communities[10]
7	Supervised hands-on practice in the ward with coaching, observation, and feedback	Practice checklist; infection control nurse as coach	240 min	Learning from actual practice and feedback improves care processes[9]
8	After action review, lessons learned, posttest, and PPE demonstration assessment	Knowledge test, practice assessment, PPE demonstration checklist	120 min	Evaluation of system outcomes and review for continuous improvement through the PDCA cycle[9]

2.2 Quality verification of the system Three experts (1 physician, 1 infection control nurse, and 1 nursing instructor) assessed the appropriateness of the system, yielding IOC values of 0.67–1.00, and suggested revising the isolation flowchart and adding a PPE donning checklist. The researcher revised the system accordingly and piloted it with 10 patients for 2 weeks (July–August 2024) before full implementation. In the pilot, personnel completed the screening form and NEWS2

record in 90% of cases, no in-ward transmission occurred, redundant forms were reduced, and zone signage was made clearer.

3. Effects of the System on Personnel Knowledge and Practice

3.1 Within-group comparison before and after the intervention In the experimental group, the mean knowledge score increased from 11.45±2.18 to 17.62±1.55 and the mean practice score from 33.24±4.71 to 45.07±3.02, both statistically significant (p <0.001), whereas the control group showed no significant changes (p = 0.077 and 0.243, respectively). The mean differences in the experimental group were 6.17 points for knowledge (95% CI 5.40–6.94) and 11.83 points for practice (95% CI 10.19–13.47), as shown in Table 2.

Table 2 Comparison of mean knowledge and practice scores before and after system implementation by group

Variable	Group	Before		After		Level	$\bar{d}$	95%CI	t	p-value
		$\bar{x}$	S.D.	$\bar{x}$	S.D.					
Knowledge (full score 20)	Exp.	11.45	2.18	17.62	1.55	Good	6.17	5.40–6.94	16.38	<0.001*
Knowledge (full score 20)	Control	11.28	2.34	12.14	2.27	Mod.	0.86	−0.10–1.82	1.83	0.077
Practice (full score 50)	Exp.	33.24	4.71	45.07	3.02	Good	11.83	10.19–13.47	14.81	<0.001*
Practice (full score 50)	Control	33.69	4.88	34.83	4.51	Mod.	1.14	−0.82–3.10	1.19	0.243

*Statistically significant at p-value <.05; Exp. = experimental; Mod. = moderate

3.2 Comparison between the experimental and control groups Before the intervention, knowledge and practice scores did not differ between the groups (p = 0.776 and 0.722, respectively). After the intervention, the experimental group had significantly higher knowledge and practice scores than the control group (p <0.001), with posttest differences of 5.48 points for knowledge (95% CI 4.46–6.50; Cohen's d = 2.82) and 10.24 points for practice (95% CI 8.22–12.26; d = 2.67). In the analysis of covariance adjusted for pretest scores, the experimental group still had higher knowledge (adjusted mean difference 5.41, 95% CI 4.50–6.33; F(1,55) = 140.88, p <0.001, partial η^2 = 0.72) and practice scores (adjusted mean difference 10.40, 95% CI 8.60–12.21; F(1,55) = 133.25, p <0.001, partial η^2 = 0.71) than the control group, as shown in Table 3.

Table 3 Comparison of mean knowledge and practice scores between the experimental and control groups

Variable	Experimental group		Control group		Level	$\bar{d}$	95%CI	t	p-value
	$\bar{x}$	S.D.	$\bar{x}$	S.D.					
Knowledge, before (full score 20)	11.45	2.18	11.28	2.34	Low / Low	0.17	−1.02–1.36	0.29	0.776

Variable	Experimental group		Control group		Level	$\bar{d}$	95%CI	t	p-value
	$\bar{x}$	S.D.	$\bar{x}$	S.D.					
Knowledge, after (full score 20)	17.62	1.55	12.14	2.27	Good / Mod.	5.48	4.46–6.50	10.74	<0.001*
Practice, before (full score 50)	33.24	4.71	33.69	4.88	Mod. / Mod.	−0.45	−2.97–2.07	−0.36	0.722
Practice, after (full score 50)	45.07	3.02	34.83	4.51	Good / Mod.	10.24	8.22–12.26	10.16	<0.001*

*Statistically significant at p-value <.05; Mod. = moderate

3.3 Good practice and PPE demonstration results After the intervention, 96.55% of the experimental group demonstrated good practice compared with 20.69% of the control group (χ^2 = 34.40, p <0.001), and 93.10% passed the PPE demonstration compared with 55.17% (χ^2 = 10.88, p = 0.001), as shown in Table 4. During the 10-month follow-up (December 2024–September 2025), no occupational respiratory infections occurred among personnel in the experimental group, whereas 3 cases (10.34%) occurred in the control group; the difference was not statistically significant (Fisher's exact test, p = 0.237). Occupational infection was defined as a laboratory-confirmed respiratory infection in a staff member within 14 days of exposure to an infected patient at work, with no history of exposure to infected persons outside work, monitored through reports from the infection prevention and control and occupational health units of both hospitals.

Table 4 Comparison of good practice and PPE demonstration results after the intervention between the experimental and control groups

Variable/Status	Experimental group n (%)	Control group n (%)	χ^2	p-value
Overall practice after intervention: good (≥40 points)	28 (96.55)	6 (20.69)	34.40	<0.001*
Moderate or low (<40 points)	1 (3.45)	23 (79.31)		
PPE donning and doffing demonstration: pass	27 (93.10)	16 (55.17)	**10.88**	**0.001***
Fail	2 (6.90)	13 (44.83)		

*Statistically significant at p-value <.05

Discussion

Regarding the first objective, the problems identified in the inpatient department included screening without prior knowledge of risk levels, insufficient personal protective equipment, limited staffing, and a service area close to the general ward building that made isolation difficult. These reflect the context of a 30-bed community hospital that admits patients with all conditions in the same area. Analyzing problems across structure, process, and outcome according to Donabedian's framework was therefore appropriate for system development[9] and consistent with internationally recommended principles of patient isolation and transmission prevention.[5,6]

Regarding the second objective, the developed system comprised six interconnected components, ranging from patient screening and isolation, nursing practice guidelines, infection prevention and control, symptom monitoring with NEWS2, and referral with SBAR to education and discharge planning.[6,7,8] The system was built through multidisciplinary participation using the PDCA cycle, adapted to the limited resources of a community hospital, and verified by experts (IOC 0.67–1.00) and a pilot test before implementation, which may have facilitated its acceptance and adoption by personnel.

Regarding the third objective, after implementation, the experimental group had significantly higher knowledge and practice scores than before the intervention and than the control group ($p < 0.001$), whereas the control group showed no significant change. This may be explained by the program's combination of lectures, demonstrations, simulations, and supervised hands-on practice with coaching and feedback, which enabled personnel to understand and apply infection prevention principles more accurately.[5,6] The PPE demonstration results are consistent with a Cochrane systematic review showing that face-to-face training, simulation, and video-based training reduce doffing errors more than written materials or lectures alone,[14] and with a study at Phon Thong Hospital, Roi Et Province, in which a nursing model comprising knowledge and competency development, nursing practice guidelines, and supervision significantly increased registered nurses' knowledge and practice scores for preventing transmission.[15] However, the very large effect sizes (Cohen's d >2.5) may have been influenced by a ceiling effect of the knowledge test, the use of the same test within 9 weeks, and differences between hospitals, and should therefore be interpreted with caution.

Limitations of this study include the lack of random sampling; the control group came from a different hospital, so not all confounding variables could be controlled; the sample size was small; and patient outcomes were not analyzed inferentially. In addition, there was only one hospital per group, so the effects of the system may be confounded with between-hospital differences; blinding of assessors was limited; and knowledge and practice were not re-measured during follow-up.

Conclusion

The care system for patients with communicable respiratory diseases in the inpatient department of Namon Hospital comprised six components: patient screening and isolation, nursing practice guidelines, infection prevention and control, symptom monitoring and referral, patient and family education, and follow-up evaluation. After implementation, the experimental group's knowledge and practice

scores increased and were significantly higher than those of the control group ($p < 0.001$), with good practice in 96.55% versus 20.69% and PPE demonstration pass rates of 93.10% versus 55.17%.

Recommendations

1. Recommendations for applying the findings Inpatient departments of community hospitals may adopt the six-component system and 8-week program, emphasizing PPE donning and doffing demonstrations and supervised ward-based practice with coaching. In addition, isolation areas and dedicated patient equipment, such as vital sign monitors, should be provided; personnel should attend regular refresher training; and updates from the Department of Disease Control and the Ministry of Public Health should be followed to keep guidelines current.

2. Recommendations for future research Future studies should examine patient outcomes, such as satisfaction, referral time, length of hospital stay, and mortality; use randomized designs with long-term follow-up across multiple community hospitals; and use designs suited to unit-level interventions, such as cluster randomized trials involving several hospitals.

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References

1. Department of Disease Control, Ministry of Public Health (TH). COVID-19 situation in Thailand [Internet]. Nonthaburi: Department of Disease Control; 2022 [cited 2022 Apr 28]. Available from: https://ddc.moph.go.th/viralpneumonia/faq_more.php (in Thai)

2. GBD 2021 Lower Respiratory Infections and Antimicrobial Resistance Collaborators. Global, regional, and national incidence and mortality burden of non-COVID-19 lower respiratory infections and aetiologies, 1990–2021: a systematic analysis from the Global Burden of Disease Study 2021. Lancet Infect Dis. 2024;24(9):974-1002.

3. Department of Disease Control, Ministry of Public Health (TH). Influenza situation: Department of Disease Control reports rising cases and recommends vaccination [Internet]. Nonthaburi: Department of Disease Control; 2025 Feb 25 [cited 2025 Dec 15]. Available from: https://ddc.moph.go.th/brc/news.php?news=50441&deptcode=brc&news_views=3957 (in Thai)

4. Kalasin Provincial COVID-19 Emergency Operations Center. COVID-19 situation in Kalasin Province [Internet]. Kalasin: Kalasin Provincial Public Health Office; 2022 [cited 2022 May 1]. Available from: http://appksn.moph.go.th/ics/web/ (in Thai)

5. Siegel JD, Rhinehart E, Jackson M, Chiarello L; Healthcare Infection Control Practices Advisory Committee. 2007 guideline for isolation precautions: preventing transmission of infectious agents in health care settings. Am J Infect Control. 2007;35(10 Suppl 2):S65-164.

6. World Health Organization. Infection prevention and control during health care when coronavirus disease (COVID-19) is suspected or confirmed: interim guidance, 12 July 2021. Geneva: World Health Organization; 2021. Report No.: WHO/2019-nCoV/IPC/2021.1.

7. Royal College of Physicians. National Early Warning Score (NEWS) 2: standardising the assessment of acute-illness severity in the NHS. Updated report of a working party. London: Royal College of Physicians; 2017.

8. Haig KM, Sutton S, Whittington J. SBAR: a shared mental model for improving communication between clinicians. Jt Comm J Qual Patient Saf. 2006;32(3):167-75.

9. Donabedian A. The quality of care: how can it be assessed? JAMA. 1988;260(12):1743-8.

10. Department of Medical Services, Ministry of Public Health (TH). Practice guideline for healthcare personnel on advising patients and providing COVID-19 Home Isolation services (revised edition) [Internet]. Nonthaburi: Department of Medical Services; 2022 Jan 4 [cited 2022 Apr 28]. Available from: https://covid19.dms.go.th/Content/Select_Landding_page?contentId=160.pdf (in Thai)

11. Wannala S, Pakkasinang T, Phochaila K. Development of a respiratory infection patient care system in the Emergency and Forensic Nursing Department, Pho Chai Hospital, Roi Et Province. J Res Health Inno Dev. 2025;6(2):346-60. (in Thai)

12. Cohen J. Statistical power analysis for the behavioral sciences. 2nd ed. Hillsdale (NJ): Lawrence Erlbaum Associates; 1988.

13. Faul F, Erdfelder E, Lang AG, Buchner A. G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behav Res Methods. 2007;39(2):175-91.

14. Verbeek JH, Rajamaki B, Ijaz S, Sauni R, Toomey E, Blackwood B, et al. Personal protective equipment for preventing highly infectious diseases due to exposure to contaminated body fluids in healthcare staff. Cochrane Database Syst Rev. 2020;4(4):CD011621.

15. Kruawan R. Development of nursing model for prevention of antimicrobial resistance transmission at Phonthong Hospital, Roi Et Province. J Res Health Inno Dev. 2026;7(Suppl 1):141-52. (in Thai)

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