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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).

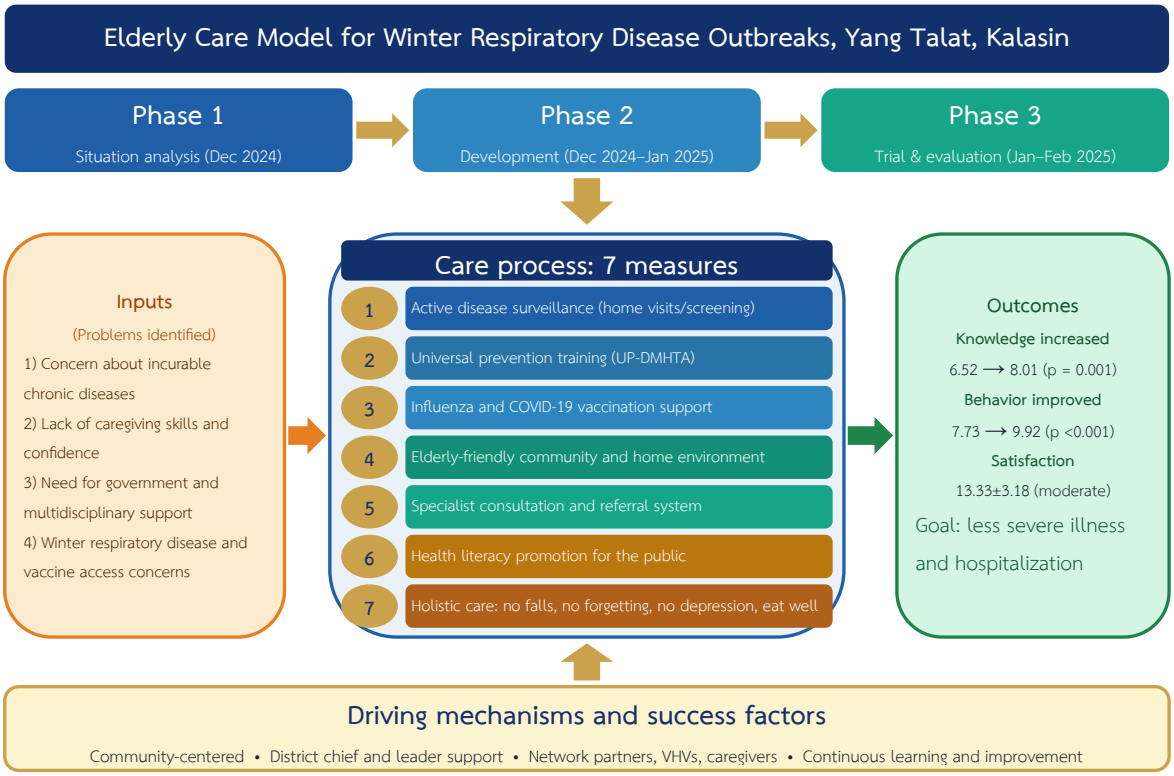

Figure 1 Diagram of the elderly care model during winter respiratory disease outbreaks, Yang Talat District, Kalasin Province

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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