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The Effects of Self-Efficacy-Based Fall Prevention Program among Elderly in Phibunmangsahan Town Municipality, Ubon Ratchathani Province, Thailand

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ABSTRACT

Background: Falls among the elderly remain a significant public health concern, particularly in rural areas where access to healthcare and fall prevention programs are limited.

Aims: This study aims to evaluate the effectiveness of a self-efficacy-based fall prevention program in improving knowledge, muscle strength, mobility, and balance among elderly individuals at risk of falling in Phibunmangsahan Town Municipality.

Methods: This quasi-experimental study included 60 elderly participants (aged 60-79) who were identified as being at risk of falling using the Thai Falls Risk Assessment Test (Thai-FRAT). Participants were randomly assigned to either an experimental group (n=30) or a control group (n=30). The experimental group received an 8-week fall prevention program based on self-efficacy theory, which included educational sessions, exercise interventions, and confidence-building strategies. Data collection was conducted using pre- and post-intervention questionnaires, physical assessments of muscle strength, mobility, and postural control, and statistical analysis was performed using paired t-tests and independent t-tests to evaluate the effectiveness of the intervention.

Results: The results revealed that participants in the experimental group showed significant improvements in their knowledge of fall prevention ($Mean_{before}$=11.33 (SD.=3.88), $Mean_{after}$= 11.90 (SD.=1.88), mobility ($Mean_{before}$=12.63 (SD.=3.88), $Mean_{after}$= 10.27 (SD.=3.12), balance ($Mean_{before}$=9.23 (SD.=2.67), $Mean_{after}$= 11.43 (SD.=3.19), and muscle strength ($Mean_{before}$=8.97 (SD.=2.94), $Mean_{after}$= 11.43 (SD.=3.49), compared to their pre-intervention levels and the control group ($p<0.05$). The control group showed no significant changes in these variables. Additionally, there were no significant negative results observed during the study.

Conclusion: The self-efficacy-based fall prevention program significantly enhanced the knowledge, physical capabilities, and self-confidence of elderly participants, highlighting its potential as an effective intervention for fall prevention in community settings. This study recommends the implementation of similar programs in other rural areas to reduce fall-related injuries among the elderly, emphasizing the importance of integrating self-efficacy theory into fall prevention strategies.

Keywords: *Fall prevention; Self-Efficacy Theory; Elderly health*.

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1. Introduction

Thailand entered the aging society in 2005, with the elderly population accounting for 10.4% and steadily increasing. The World Health Organization (WHO) (2008) predicts an annual increase of at least 3% in the population aged 60 years and above. In 2021, Thailand had more than 12 million elderly people aged 60 and above, accounting for approximately one-sixth of the country's population. This places Thailand as the second highest in Southeast Asia, after Singapore. Additionally, Thailand is forecasted to become the first developing country in the world to fully transition into an Aged Society (Kasemsup, 2021). It is projected that by 2040, Thailand's elderly population ratio will reach 32.1% (Thailand Science Research and Innovation, 2020). The rapid changes in the elderly population have significant implications for health, the economy, and society as a whole. Preparation to address the challenges of an aging society is therefore crucial. The elderly population is at a higher risk of chronic illnesses, leading to increasing healthcare costs. The Thai Health Insurance Development Research Office estimates that the budget required for long-term care for dependent elderly individuals averages approximately 15,000 million baht per year, equivalent to 0.1% of GDP.

According to the measurement of health problems in Thailand using Disability-Adjusted Life Years (DALY), falls are classified as a specific disease group among the elderly (geriatric syndrome) and are the leading cause of death in the unintentional injury category. The World Health Organization reports that individuals aged 65 years and older have a fall risk of 28-35% per year, which increases to 32-42% among those aged 70 and above (Thai Health Promotion Foundation,2019). Statistics gathered between 2022-2023, 49 elderly individuals in the Regional Health 9 area were injured by falls, with 69.4% being female. The majority of those affected were aged 80 and over (40.8%), many of whom had chronic diseases (61.2%) and were using multiple medications (61.2%). Common conditions included visual impairments (38.8%) and balance issues (42.9%), with 46.7% having a history of falls in the past six months. Most falls occurred at home (52.8%), often due to walking (69.4%) or slippery floors (61.2%). Bone fractures were reported in 38.8% of cases, and 89.8% required hospitalization, with 27 undergoing orthopedic surgery. (Srichang et al., 2024). In 2020, a total of 123,765 elderly individuals were admitted to outpatient departments due to falls, resulting in an incidence rate of 1,071 per 100,000 population. Additionally, 1,400 elderly individuals died from falls, with a death rate of 12.1 per 100,000 elderly population, averaging four deaths per day (Department of Disease Control Injury Prevention Division, 2021). The most common cause of falls was slipping, stumbling, or misstepping on the same level floor, accounting for 67.4% of cases, while falls from steps and stairs accounted for 5.2%. The causes of falls in the elderly can be attributed to various risk factors, both intrinsic and extrinsic. Intrinsic factors include chronic illnesses such as Parkinson's disease, osteoarthritis, and high blood pressure, while extrinsic factors refer to environmental or external factors that contribute to falls (Institute of Geriatric Medicine, 2019).

When an elderly person experiences a fall, it has significant impacts on their physical health, mental well-being, and the economy. Physically, falls can result in injuries ranging from minor to severe, with approximately one in three falls leading to such injuries. Falls are the primary cause of hospital admissions among individuals aged 65 and older. A study found that the average cost of medical treatment for an elderly person who falls and suffers a hip fracture, requiring hospitalization for 1-3 days, is 30,646.19 baht per person. For those who require treatment for more than three days, the average cost increases to 60,401.72 baht. Individuals without broken bones typically stay for treatment an average of 6.4 days, with medical expenses averaging between 19,419.30 and 25,728.00 baht per person (Janpilom & Chutitharamanan, 2021). In some cases, after being discharged from the hospital, elderly individuals may no longer be able to care for themselves, leading to their children or relatives having to resign from work to provide full-time care or hire a specialized caregiver. This increases the financial burden and causes stress and worry for both the elderly person and their family. Additionally, elderly individuals who have experienced falls often develop anxiety and a loss of confidence in performing daily activities. This can lead to reduced social interaction and a decrease in participation in social activities.

According to the population database from the Ubon Ratchathani Provincial Public Health Office's Health Data Center (2021), Ubon Ratchathani Province entered the "aging society" category in 2021. Phibunmangsahan District is one of the districts in the province that has reached this stage, with the elderly population aged 60 years and above accounting for 14.35%. In another district, the elderly population aged 60 years and above is 14.44%. Statistics on service visits due to falls (W00-W19) at Phibunmangsahan Hospital from 2018 to 2021 show that a significant percentage of elderly individuals received care for falls. The percentages were 26.86%, 22.41%, 24.52%, and 20.21%, respectively. Additionally, health screenings conducted in the area under the responsibility of the Phibunmangsahan Hospital Community Health Center revealed that the elderly population in the area is increasingly at risk of falls, with the risk steadily rising each year. The World Health Organization has proposed a model for preventing falls, which includes raising awareness among the elderly about the importance of fall prevention, assessing individual fall risk factors, implementing appropriate environmental and social measures, and designing community-specific fall prevention strategies (Institute of Geriatric Medicine, 2019). In 2021, the Department of Disease Control, under the Ministry of Public Health, launched fall prevention initiatives. Primary-level agencies were involved in screening and evaluating at-risk groups, ensuring home safety, promoting knowledge about risk factors and prevention, encouraging at-risk groups to engage in continuous exercise for at least 150 minutes per week, establishing fall prevention and care systems for the elderly, and building network capacities.

The researcher has developed a comprehensive program that combines various activities to prevent falls among the elderly. Previous studies have shown that using multiple methods or factors for fall prevention can effectively reduce the incidence of falls in elderly individuals. The program in this study includes providing knowledge about the causes and risk factors associated with falls, promoting the appropriate use of medication, creating a safe environment, and incorporating specific exercises to improve walking, balance, and movement in three planes, thereby strengthening muscles and bones. One of the exercises included in the program is the Maneevej exercise, created by Prasit Maneejira Prakan. This exercise focuses on balancing the entire body structure and involves movements that engage all parts of the body to create balance between the left and right sides. It helps increase muscle flexibility and overall balance (Waichompu, 2021). The program also includes a low-impact aerobic exercise schedule, similar to brisk walking but without any jumping. This type of exercise is safe and well-suited for the elderly, improving physical fitness in terms of muscle and joint flexibility, and has been shown to significantly reduce the rate of falls among elderly individuals (Sermsinsiri et al., 2019; Nokham et al., 2016). Each activity in the program is designed to provide knowledge, understanding, and learning opportunities for the elderly to develop appropriate fall prevention behaviors. Additionally, the program incorporates the concept of self-efficacy theory by Bandura, which is highly suitable for promoting health and encouraging behavior change (Sirited & Thammaseeha, 2019). By enhancing self-efficacy, the program empowers the elderly to believe in their ability to prevent falls and motivates them to engage in continuous fall prevention behaviors. This approach can effectively reduce both the rate of falls and fall-related injuries in the elderly.

2. Methods

Study design and sample

This research is a non-blinded quasi-experimental study conducted to evaluate the effectiveness of a fall prevention program for the elderly in Phibunmangsahan Town Municipality. The sample consisted of elderly individuals aged 60-79 years from Phibunmangsahan Town Municipality and Kutchomphu Sub-district Municipality, located in Phibunmangsahan District, Ubon Ratchathani Province. Participants were selected based on their results from the Thai Falls Risk Assessment Test (Thai-FRAT), with a score of 4 or higher indicating a higher risk of falls. The sample size was determined through a power analysis using G*Power software (version 3.1), with a significance level of 0.05, statistical power of 0.80, and an effect size of 0.73. The sample was equally divided into two groups: an experimental group and a control group, each consisting of 30 participants using lottery method. The data collection took place between October 2022 and February 2023. The study utilized purposive sampling, selecting individuals who were at a higher risk of falls based on the results from the Thai-

FRAT. The inclusion criteria for the study included elderly individuals aged 60-79 years who scored 4 or more on the Thai-FRAT, indicating a higher risk of falls. Those with severe physical or cognitive impairments that might prevent them from participating in the program were excluded. There were no specific mentions of dropouts in the study, and the final sample consisted of the planned 60 participants.

Measurements

The independent variables in this study include the various components of the fall prevention program, such as providing knowledge on the causes and risk factors of falls, promoting appropriate medication use, ensuring a safe environment, and incorporating exercises aimed at improving balance, walking, and muscle strength. This program, known as the Self-Efficacy-Based Fall Prevention Program, is an 8-week intervention tailored for older adults. It integrates health education, environmental assessment, safe medication practices, and structured physical activities—including square stepping, balance and gait training, and traditional Thai Manee-wet exercises—to enhance muscle strength, coordination, and confidence. The program also encourages knowledge exchange and experience sharing among participants, reinforcing their self-efficacy in preventing falls. It is designed specifically for community-dwelling elderly aged 60–79 years, as the activities are of light to moderate intensity, easy to follow, and safe for those within this age range.

The dependent variables were the outcomes of the program, which included changes in the participants' knowledge about fall prevention, self-efficacy regarding fall prevention, expectations of the program's outcomes, and physical fitness (e.g., muscle strength, mobility, and balance). Data were collected using several tools, including interviews and physical fitness assessments. These tools consisted of a personal information interview form, a knowledge interview form regarding fall prevention, a self-efficacy interview form, an interview form on expectations of results, and a physical fitness assessment. The personal information interview form consisted of 11 questions related to demographics and health status. The knowledge form included 20 questions aimed at assessing participants' understanding of fall prevention, with scores categorized into high, moderate, and low levels of knowledge. The self-efficacy interview form consisted of 10 questions that measured the participants' confidence in their ability to prevent falls on a 4-point scale. The expectations form utilized a 5-level rating scale to assess the participants' expectations regarding the program's effectiveness. The physical fitness assessment included tests such as the Timed Up & Go Test, the 4-Stage Balance Test, and the 30-Second Chair Stand Test to measure balance, strength, and mobility. These tools were administered by the researchers, who ensured consistency and accuracy during the process. The content validity of the tools was confirmed by experts. The reliability of the knowledge questionnaire was assessed using the Kuder-Richardson 20 (KR-20) formula, which yielded a reliability coefficient of 0.857. Cronbach's alpha was used to assess the reliability of the self-efficacy and outcome expectations questionnaires, with both showing coefficients of 0.795, indicating good internal consistency.

Statistical analysis

The data collected in this study were analyzed using both descriptive and inferential statistics. Descriptive statistics were used to summarize and describe the demographic data and baseline measurements of the participants. To test the research hypotheses, the researchers employed the paired t-test and independent t-test. The paired t-test was used to compare pre- and post-program outcomes within each group (experimental and control), allowing the researchers to evaluate the effect of the program on the participants' knowledge, self-efficacy, and physical fitness. The independent t-test was used to compare the outcomes between the experimental and control groups, assessing the effectiveness of the fall prevention program in reducing the risk of falls. A significance level of 0.05 was set, meaning that p-values less than 0.05 were considered statistically significant. These statistical tests helped determine whether the fall prevention program had a meaningful impact on the participants' health behaviors and physical abilities.

Ethical approval

The study was approved by the Human Research Ethics Committee of Ubon Ratchathani University, ensuring that ethical guidelines for research involving human participants were followed. The approval reference number for the study was UBU-REC-130/2022, and the study received ethical clearance on September 8, 2022. Informed consent was obtained from all participants before their involvement in the study. The participants were fully informed about the purpose of the research, the procedures involved, any potential risks, and their right to withdraw at any time without penalty. The study adhered to the ethical principles outlined in the Declaration of Helsinki and the guidelines for Good Clinical Practice (ICH GCP). By obtaining informed consent, the researchers ensured that the participants understood their rights and agreed voluntarily to participate in the study.

3. Results

In this study, the personal characteristics of the experimental and control groups were compared to assess whether there were any significant differences between the two groups. The comparison was based on general demographic information (Table 1), and statistical analysis revealed no significant differences between the two groups ($p > 0.05$). The general characteristics of each group are summarized in this section:

The experimental group consisted mostly of females (76.7%), with a mean age of 71.4 years (SD = 5.00). The average body mass index (BMI) was classified as obesity class I (25.00–29.99 kg/m²). Regarding marital status, 50.0% were married. In terms of occupation, 43.3% were unemployed, followed by 30.0% who were housewives. The highest education level for 86.7% of the participants was primary school. Most participants (66.7%) had congenital diseases and regularly took medications. The most common condition was hypertension (41.0%), followed by diabetes (28.2%). Additionally, 80.0% of participants did not consume alcohol, and 96.7% did not smoke. Within the past six months, 40.0% had experienced a fall.

The control group was also predominantly female (70.0%), with a mean age of 69.9 years (SD = 5.53). The majority had a BMI categorized as overweight (23.00–24.99 kg/m²). Regarding marital status, 63.3% were married. In terms of occupation, 43.3% were engaged in agriculture, followed by 36.7% who were unemployed. The highest education level for 90.0% of the participants was primary school. Most participants (80.0%) had congenital diseases and regularly took medications, with the most common condition being hypertension (36.8%), followed by diabetes (17.5%). Furthermore, 90.0% did not consume alcohol, and all participants (100%) were non-smokers. In the past six months, 33.3% had experienced a fall.

Table 1. Comparison of general demographic characteristics between the experimental and control groups

General information	Experimental group (n=30)		Control group (n=30)		p-value
	Number (percentage)		Number (percentage)		
Sex					
Male	7	(23.3)	9	(30.0)	0.559
Female	23	(76.7)	21	(70.0)	
Age					
60-64 years old	3	(10.0)	5	(16.7)	0.548
65-69 years old	8	(26.7)	8	(26.7)	
70-74 years old	11	(36.7)	11	(36.7)	
75-79 years old	8	(26.7)	6	(20.0)	
	Mean =71.4, SD.=5.00		Mean =69.9, SD.=5.53		
Body mass index level (kg/m²)					
Low or thin (<18.5)	3	(10.0)	2	(6.7)	0.072*
Normal (18.5 – 22.99)	9	(30.0)	6	(20.0)	
Overweight (23.00 – 24.99)	6	(20.0)	9	(30.0)	
Obesity Level 1 (25.00 – 29.99)	10	(33.3)	6	(20.0)	
Obesity Level 2 (30 and above)	2	(6.7)	7	(23.3)	

General information	Experimental group (n=30)		Control group (n=30)		p-value
	Number (percentage)		Number (percentage)		
Status					
Single	3	(10.0)	1	(3.3)	0.548*
Married	15	(50.0)	19	(63.3)	
Widow	11	(26.7)	8	(26.7)	
Divorce/Separation	1	(3.3)	2	(6.7)	
Occupation					
Not working	13	(43.3)	11	(36.7)	0.072*
Housewife	9	(30.0)	3	(10.0)	
Agriculture	4	(13.3)	13	(43.3)	
Serving in the pension service	2	(6.7)	1	(3.3)	
General contractor	1	(3.3)	1	(3.3)	
Trade	1	(3.3)	1	(3.3)	
Education					
Primary school	26	(86.7)	27	(90.0)	0.802*
Secondary school	3	(10.0)	2	(6.6)	
Bachelor's degree	1	(3.3)	1	(3.3)	
Congenital diseases					
Without	10	(33.3)	6	(20.0)	0.243
Have	20	(66.7)	24	(80.0)	
Hypertension	16	(41.0)	21	(36.8)	
Diabetes	11	(28.2)	10	(17.5)	
Osteoarthritis	3	(7.7)	3	(5.3)	
Psychiatric disorders	1	(2.6)	2	(3.5)	
Stroke	1	(3.3)	0	(0.0)	
Other diseases	23	(17.9)	20	(17.5)	
History of taking medication regularly					
Without	10	(33.3)	6	(20.0)	0.243
Have	20	(66.7)	24	(80.0)	
Antihypertensive drugs	16	(27.6)	21	(31.3)	
Diabetes medication	11	(19.0)	10	(14.9)	
Muscle relaxants/painkillers	5	(8.6)	3	(4.5)	
Diuretics	3	(5.2)	4	(6.0)	
Tranquilizer	2	(3.4)	1	(1.5)	
Vasodilators	1	(1.7)	2	(3.0)	
Sleeping pill	1	(1.7)	2	(3.0)	
Antihistamines	1	(1.7)	1	(1.5)	
Other medicines	10	(31.0)	6	(34.3)	
Drinking alcohol					
Do not drink	24	(80.0)	27	(90.0)	0.472*
Drink	6	(20.0)	3	(10.0)	
3-4 times a week.	1	(3.3)	0	(0.0)	
1-2 times a week.	1	(3.3)	0	(0.0)	
1-3 times a month.	3	(10.0)	0	(0.0)	
Less than once a month.	1	(3.3)	3	(10.0)	
Smoking					
No Smoking	29	(96.7)	30	(100)	0.313
Smoke	1	(3.3)	0	(0.0)	

General information	Experimental group (n=30)		Control group (n=30)		p-value
	Number (percentage)		Number (percentage)		
Falling in the past 6 months					
Never	18	(60.0)	20	(66.7)	0.529
Ever	12	(40.0)	10	(33.3)	
1 time	10	(33.3)	7	(23.3)	
2 times	2	(6.7)	3	(10.0)	

*Fisher's Exact Test

The Paired Samples T-Test showed that in the experimental group, the mean knowledge score before and after participating in the program differed significantly at the 0.05 level (p-value < 0.001, 95% CI = -6.92 to -4.21). In the control group, the difference in mean knowledge scores before and after the program was not statistically significant at the 0.05 level (p-value = 0.132, 95% CI = -0.83 to 0.238). The mean self-efficacy score before and after the program in the experimental group also showed a statistically significant difference at the 0.05 level (p-value < 0.001, 95% CI = -3.22 to -1.37). In contrast, the control group showed no statistically significant difference in self-efficacy scores before and after the program (p-value = 0.429, 95% CI = -1.49 to 0.03). Regarding outcome expectancy, the mean score before and after participating in the program in the experimental group differed significantly at the 0.05 level (p-value < 0.001, 95% CI = -6.87 to -3.79). In the control group, the difference in outcome expectancy scores before and after the program was not statistically significant (p-value = 0.096, 95% CI = -1.35 to 0.28), as shown in Table 2.

Table 2. Comparison of mean scores on fall prevention knowledge, self-efficacy, and outcome expectancy among older adults in the experimental and control groups before and after participating in the program

List	Before (n=30)		After (n=30)		Mean Diff	t	95%CI	p-value
	Mean	(SD)	Mean	(SD)				
Knowledge of Fall Prevention in the Elderly								
Experimental group	11.33	3.88	16.90	1.88	-5.56	-8.40	-6.92 to -4.21	<0.001*
Control group	11.63	3.26	11.93	3.47	-0.30	-1.14	-0.83 to 0.238	0.132
Awareness of one's ability to prevent falls in the elderly.								
Experimental group	18.33	4.60	20.63	4.04	-2.30	-5.10	-3.22 to -1.37	<0.001*
Control group	16.40	4.68	16.46	4.49	-0.06	-1.18	-0.81 to 0.68	0.429
Expected Results in Preventing Falls in the Elderly								
Experimental group	22.66	6.52	28.00	5.46	-5.33	-7.07	-6.87 to -3.79	<0.001*
Control group	22.90	6.31	23.43	5.67	-0.53	-1.33	-1.35 to 0.28	0.096

Results after Participating in the Program

Knowledge of Fall Prevention in the Elderly: Before the program, there was no statistically significant difference between the experimental and control groups in terms of knowledge scores (p = 0.365, 95% CI -1.43 to 2.03). However, after the program, there was a significant difference between the two groups (p < 0.001, 95% CI -6.32 to -3.33).

Perceived Self-Efficacy in Preventing Falls: Before participating in the program, the mean self-efficacy scores of both groups were not significantly different (p = 0.056, 95% CI -4.77 to -0.10). After the program, however, there was a statistically significant difference between the groups (p < 0.001, 95% CI -6.10 to -1.69).

Expectations of Fall Prevention Results: Prior to the program, there was no statistically significant difference between the experimental and control groups regarding their expectations for the program’s outcomes (p = 0.444, 95% CI -3.08 to 3.55). After participating in the program, however, there was a significant difference in expectations between the groups (p = 0.001, 95% CI -7.44 to -1.68), as shown in Table 3.

Table 3. Knowledge scores, Self-efficacy and outcome expectations for preventing falls in the elderly between the experimental group and the control group before and after joining the program

Variable	Experimental group (n=30)		Control group (n=30)		Mean Diff	t	95%CI	p-value
	Mean	SD	Mean	SD				
Knowledge								
Before	11.33	3.88	11.63	3.26	0.30	0.347	-1.43 to 2.03	0.365
After	16.90	1.88	11.93	3.47	-4.96	-6.88	-6.41 to -3.51	<0.001*
Perception of self-efficacy								
Before	18.33	4.60	16.40	4.68	-1.93	-1.61	-4.33 to 0.46	0.056
After	20.63	4.04	16.46	4.49	-4.16	-3.54	-6.37 to -1.65	<0.001*
Results Expectations								
Before	22.66	6.52	22.90	6.31	0.23	0.14	-3.08 to 3.55	0.444
After	28.00	5.46	23.43	5.67	-4.56	-3.17	-7.44 to -1.68	0.001*

*p-value (p<0.05), statistically significant at level 0.05

Physical Fitness between the Control and Experimental Groups before and after Participating in the Program

Timed Up & Go Test Scores: Before participating in the program, there was no statistically significant difference in the average Timed Up & Go Test scores between the experimental and control groups (p = 0.275, 95% CI -1.47 to 2.74). However, after the program, the difference between the two groups became statistically significant (p = 0.008, 95% CI 0.56 to 5.16).

4-Stage Balance Test Scores: Before the program, there was no significant difference in the average scores of the 4-Stage Balance Test between the experimental and control groups (p = 0.461, 95% CI -1.42 to 1.29). After the program, the difference between the groups became statistically significant (p = 0.012, 95% CI -3.68 to -0.25).

30-Second Chair Stand Test Scores: Before participating in the program, the average scores of the 30-Second Chair Stand Test between the experimental and control groups showed no statistically significant difference (p = 0.211, 95% CI -1.03 to 2.43). After the program, however, the difference became statistically significant (p = 0.018, 95% CI -3.86 to -0.13). No adverse events or injuries related to the intervention were reported during the study. This result is summarized in Table 4.

Table 4. The average physical fitness scores between the control group and the experimental group before and after joining the program

Variable	Experimental group (n=30)		Control group (n=30)		Mean Diff	t	95%CI	p-value
	Mean	(SD)	Mean	(SD)				
Timed Up & Go Test								
Before	12.63	3.88	13.27	4.26	0.63	0.60	-1.47 to 2.74	0.275
After	10.27	3.12	13.13	5.41	2.86	2.59	0.56 to 5.16	0.008*
The 4-Stage Balance Test								
Before	9.23	2.67	9.17	2.57	-0.06	-0.09	-1.42 to 1.29	0.461
After	11.43	3.91	9.47	3.44	-1.96	-2.29	-3.68 to -0.25	0.012*
30-Second Chair Stand test								
Before	8.97	2.94	9.67	3.71	0.70	0.80	-1.03 to 2.43	0.211
After	11.43	3.49	9.43	3.73	-2.00	-2.14	-3.86 to -0.13	0.018*

* p-value (p<0.05), statistically significant at level 0.05

4. Discussion

The study findings indicate that the experimental group showed significant improvement in their knowledge about fall prevention after participating in the program. This improvement was notably higher compared to the control group, with statistical significance achieved at the 0.05 level ($p < 0.001$). These results are consistent with the findings of previous studies by Sumalee Changkol (2025) and Thitima Tasuwanin (2019), which also reported an increase in fall prevention knowledge among elderly individuals involved in similar programs. The enhanced knowledge in the experimental group can be attributed to various factors. The program provided comprehensive education on the causes and risk factors of falls, which helped participants understand the importance of fall prevention and the steps they could take to mitigate these risks. The program also emphasized the proper use of medications and the creation of a safer living environment for the elderly. Additionally, the inclusion of exercises designed to improve stability in standing and walking played a key role in reinforcing the knowledge. Through lectures, media presentations, demonstrations, and interactive sessions—such as discussions on past fall experiences and prevention strategies—participants were actively engaged. The program also employed praise and encouragement, which helped build confidence and motivate participants to incorporate fall prevention behaviors into their daily routines. Notably, a significant proportion of the experimental group consisted of females who had congenital health conditions requiring regular medication. This may have heightened their awareness of fall risks, further motivating them to participate actively in the program.

In terms of perceived self-efficacy for preventing falls, the experimental group showed a significant increase both before and after the program, with their self-efficacy significantly higher than that of the control group ($p < 0.001$). This aligns with the findings of Tedniyom et al. (2019) and Pengchai et al. (2024), who observed similar improvements in self-efficacy among participants of a fall prevention program based on the self-efficacy theory. Over the 8-week program, the experimental group gained valuable knowledge about fall causes and risk factors, the dangers of falls, and how to prevent them. This knowledge was coupled with the guidance on proper medication use. The program also used modeling techniques, where researchers demonstrated exercises with a 9-box grid, accompanied by music, helping participants develop their skills and confidence. Slow-paced practice was followed by progressively more challenging exercises, and successful participants were encouraged to assist others. This peer-based learning, combined with positive reinforcement and continuous praise, boosted participants' confidence in their ability to prevent falls. According to Bandura's self-efficacy theory (1997), individuals are more likely to develop belief in their capabilities by observing successful models and experiencing positive outcomes. This approach likely contributed to the significant increase in self-efficacy observed in the experimental group, reinforcing their decision to engage in fall prevention activities.

Regarding expectations for fall prevention outcomes, the experimental group demonstrated significantly higher expectations for positive results after participating in the program compared to before ($p < 0.001$). These results are in line with the findings of Tedniyom et al. (2019), which highlighted an increase in outcome expectancy in participants of fall prevention programs based on self-efficacy principles. Throughout the program, the experimental group engaged in various activities, including lectures, demonstrations, and discussions. They also observed models and participated in practice sessions. Additional exercises aimed at improving balance were incorporated during specific weeks (Weeks 2-3 and Weeks 5-8), with demonstrations using a 9-box grid and music rhythms. Training began with slow movements and progressively incorporated faster rhythms to enhance motor coordination. The participants were consistently encouraged and praised for their progress, which helped boost their confidence. Positive changes in their physical and mental well-being were evident, not only to the participants themselves but also to those around them. This increase in self-awareness and self-confidence likely contributed to their heightened expectations for successful outcomes in preventing falls.

In terms of physical fitness, the experimental group showed significant improvements in muscle strength, movement, and balance after completing the program, compared to both their baseline measurements and the control group ($p < 0.05$). These results are consistent with the findings of Harnirattisai et al. (2015), who observed improvements in fall prevention among elderly participants engaged in physical activity programs around Bangkok. The program implemented in the current study incorporated exercises designed to improve self-efficacy, including basic movements, exercises with elastic bands, and walking on a 9-box grid. Over the 8-week period, the experimental group demonstrated significant improvements in balance and movement abilities, particularly by Weeks 4 and 8, compared to the control group. The exercise regimen included a target of 150 minutes of exercise per week, with the experimental group also encouraged to engage in additional at-home exercises for at least 2 days each week. Participants recorded their activities in an exercise journal, which not only served as a motivational tool but also encouraged consistent participation. The focus on walking exercises was particularly beneficial for improving gait, fall prevention, and daily functional abilities.

The program's exercise format, which included moderate to high-intensity activities, contributed to the observed improvements in muscle strength and balance. It is well-supported in the literature that exercises like walking on a 9-square grid can enhance cardiorespiratory endurance, muscle strength, and agility. Muscle strength typically improves within the first 2-3 weeks as the nervous system adapts, and further muscle development occurs between 6-7 weeks, leading to increased muscle power and mass. These physiological changes contribute to better control of body movements and enhanced balance, which are crucial for fall prevention in elderly individuals.

On the other hand, the improvement in balance and movement may be attributed to both physiological and psychological mechanisms. On the physiological side, regular practice of moderate- to high-intensity exercises likely enhanced muscle strength, neuromuscular control, and postural stability. On the psychological side, improved self-efficacy and confidence may have reduced fear of falling, leading to better performance and engagement. These dual mechanisms -muscle strengthening and confidence building- likely worked synergistically to produce the observed gains in balance.

The study also had several strengths. First, participant adherence was high throughout the 8 -week program, and no adverse events were reported. Second, the instruments used for outcome measurement, such as the Thai-FRAT and physical fitness tests, were standardized and validated. These factors help ensure the internal validity of the findings. However, this study also has some limitations. The sample size was relatively small (n = 60), and the follow-up period was limited to 8 weeks. As a result, the long-term sustainability of the observed improvements remains unclear. Moreover, the study was conducted in a single community setting in Thailand, which may limit the generalizability of the findings to other populations or regions. Finally, the study design was non-blinded, which may have introduced some bias, despite the efforts to standardize interventions. Future research should consider longer follow-up periods (e.g., 6–12 months) to examine whether the effects of the intervention are maintained over time. Additionally, future studies could explore the cost-effectiveness of the program, as well as its applicability in different cultural or healthcare contexts.

5. Conclusion

In conclusion, this study suggests that the fall prevention program implemented for the elderly in the experimental group had a positive impact on improving their knowledge, self-efficacy, expectations for results, and physical fitness. The participants showed significant improvements in these areas, which aligns with previous studies on fall prevention among older adults. The combination of knowledge acquisition, exercise, and positive reinforcement was effective in encouraging the elderly participants to take proactive steps to prevent falls. However, it is important to acknowledge the limitations of this study. The study period was limited to 8 weeks, and therefore, long-term results were not assessed. Specifically, the persistence of the participants' engagement in the activities introduced during the program, as well as the incidence of falls after the program's completion, were not followed up. Future research should consider extending the duration of follow-up to evaluate the sustained impact of the program on fall prevention and participants' long-term behavior changes. In practical terms, incorporating such fall prevention programs into rural primary healthcare services could enhance accessibility and continuity. Training community health volunteers to deliver these programs may also be an effective strategy to expand reaches and sustainability in community settings.

Conflict of Interest

There is no conflict of interest to declare.

References

Bandura, A. (1997). Self-efficacy: The exercise of control. New York: W.H. Freeman and Company.

Changkol, S. (2025). Effectiveness of program for prevention falls among older adults in Bang pa-in district, Ayutthaya. Journal of Environmental Education Medical and Health, 10(1), 638-646.

Department of Disease Control Injury Prevention Division. (2021). Fall Data (W00 - W19) in people aged 60 years and over [Internet]. [Cited in 8 March, 2024]. Available from: https://ddc.moph.go.th/dip/news.php?news=23567&deptcode=

Harnirattisai, T., Thongtawee, B., & Raetong, P. (2015). The effects of a physical activity program for fall prevention among Thai older adults. Pacific Rim International Journal of Nursing Research, 19(1), 4-18.

Institute of Geriatric Medicine. (2019). *Medical practice guidelines for prevention and evaluation of falls in the elderly.* Bangkok: Sinthavee Printing Co. Ltd.

Janpilom, N., & Chutitharamanan, L. (2021). Development model of emergency medical service for the older people with hip fracture. Nursing Journal of The Ministry of Public Health, 31(3), 176-188.

Kasemsup, V. (2021). Is Thailand ready to transition into a fully aging society? [Internet]. [Cited in 2 March, 2024]. Available from: https://op.mahidol.ac.th/ga/posttoday-22-2/

Nokham, R., Panuthai, S., & Khampolsiri T. (2016). Effect of square-stepping exercise on balance among older persons. Nursing Journal CMU, 43(3), 58–68.

Pengchai, T., Thiabrithi, S., & Klangkan, S. (2024). The effects of the self-efficacy enhancement program on fall prevention among the elderly in Sisaket municipality, Sisaket province. Academic Journal of Community Public Health, 10(01), 49-49.

Sermsinsiri, K., Semsri, S., & Nonakaravathin, S. (2019). The effect of square-stepping exercise on balance of elderly adults at risk of falls. Journal of The Royal Thai Army Nurses, 20(1), 359–370. Available from: https://he01.tci-thaijo.org/index.php/JRTAN/article/view/185142

Sirited, P., & Thammaseeha, N. (2019). Self-efficacy theory and self-healthcare behavior of the elderly. Journal of The Royal Thai Army Nurses, 20(2), 58–65.

Srichang, N., Singthimat, S., Lertchirakarn, P., Homhuan, S., & Riangthaisong, K. (2024) Epidemiology of elderly injured by falls based on the case study in Regional Health 9. Academic Journal of Community Public Health, 10(03), 46-46.

Tasuwanin, T., & Tappakit, K. (2017). Effect of fall prevention program among falling rate among elderly. Kasalongkham Research Journal, Chiangrai Rajabhat University, 11(3), 175–195.

Tedniyom, T., Maharachpong, N., Kijpreedarborisuthi, B., & Sakulkim, S. (2019). Effects of the self-efficacy enhancement program on fall prevention among the elderly in Autong District, Suphanburi Province. Journal of The Department of Medical Services, 44(4), 90-95.

Thailand Science Research and Innovation. (2020). The impact of stepping in towards an aging society and income inequality [Internet]. [Cited in 2 March, 2022]. Available from: https://researchcafe.tsri.or.th/aging-society-and-income-inequality/

Waichompu, N. (2021). Elderly Health Promotion with Maneevej Science. Thai Journal of Public Health and Health Science, 4(2), 219-232.

World Health Organization [WHO]. (2008). WHO global report on falls prevention in older age [Internet]. [Cited in 2 March, 2024]. Available from: https://www.who.int/publications/i/item/9789241563536

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