Association between Fear of falling and Self-Management Behaviors for Fall Prevention Among Older Adults in Chiang Rai Province.

Thitima Thasuwanain[1], Waraporn Boonchieng[2],
Aksara Thongprachum[3], Sirinun Boripuntakul[4]
[1]Student, Faculty of Public Health, Chiang Mai University
E-mail: Tithima.ta@gmail.com
[2,3,4]Lecturer, Faculty of Public Health, Chiang Mai University

Abstract

This study was a cross-sectional study aimed to examine the self-management behaviors for fall prevention among older adults in Chiang Rai Province. The study involved 415 participants. The research instruments used for data collection included a Personal data record form and a Self-management behavior questionnaire for fall prevention among older adults, developed by researchers, which had a content validity index ranging from 0.80 to 1.00 and a Cronbach's alpha reliability coefficient of 0.824. Data was collected between February to May 2025. The personal data and Self-management behaviors for fall prevention were analyzed using descriptive statistics.

The results showed that the majority of the participants were female (58.30%) and aged between 60 and 69 years (61.90%), with an average age of 68.83 ± 6.64 years. Found that the overall level of concern or fear of falling was at a moderate level (Mean = 2.10, S.D. = .931), and the overall mean score for self-management behavior for fall prevention was at a moderate level (Mean = 2.77, S.D. = 0.942). It was also found that the average scores of fears of falling and self-management in fall prevention among older adults showed a statistically significant weak negative correlation (r = -.110, p = .026).

The findings of this study can serve as a guideline for promoting fall prevention, thereby reducing fall incidence and improving the quality of life among older adults.

Keywords: *Fear of falling, Self-management Behaviors, Falling, Older adults, Chiang Rai*

Introduction

The global population of older adults is steadily increasing. According to the Department of Provincial Administration, Ministry of Interior, as of April 30, 2025, older adults accounted for 21.44% of the total population (Department of Provincial Administration, 2025), indicating that Thailand has entered a fully aged society. It has been found that aging brings about degenerative physical changes, such as declining vision, reduced balance, and decreased muscle strength and mass. These changes increase the risk of falls more than in other age groups (Xing et al., 2023).

A fall is defined as an unintentional descent from a higher to a lower position, and it poses a major health threat to older adults. After a fall, the ability to perform daily activities typically declines, and falls are

a leading cause of injury and disability in this population (Salari et al., 2022). Globally, falls are a major cause of death in individuals aged 65 years and older. In 2012, the mortality rate was 55.3 per 100,000 people, which increased to 69.9 per 100,000 in 2023. Falls are also a significant cause of disability (Hashimoto et al., 2025). In Thailand, the number of outpatients visits due to falls was 21,208.87 per 100,000 people in 2022, increasing to 36,754.22 per 100,000 in 2023. The mortality rate rose from 143 per 100,000 in 2021 to 177 per 100,000 in 2023 (Department of Disease Control, 2025). Beyond physical harm and the resulting dependence, falls also have psychological impacts. After experiencing a fall, many older adults develop Fear of Falling (FOF)—a condition affecting 20%–85% of those who have previously fallen (Sapmaz & Mujdeci, 2021). This fear limits daily activities, negatively affects health, and hinders recovery. It also reduces self-worth, leads to social withdrawal, and can contribute to depression.

Fear of Falling (FOF) refers to the fear associated with movement following a fall, which can reduce an individual's confidence in performing daily activities. Consequently, individuals may avoid movement and social interactions, ultimately impacting their quality of life (Lee & Tak, 2023). Research indicates that FOF affects between 20% and 85% of older adults and contributes to limitations in daily functioning in 30% to 50% of cases (Sapmaz & Mujdeci, 2021). A study by Xiong et al. (2024), which reviewed 153 articles involving 200,033 participants across 38 countries, reported an overall prevalence of FOF at 49.60%, with rates ranging from 6.96% to 90.34% (Xiong et al., 2024). The prevalence was higher in developing countries (53.40%) compared to developed countries (46.70%). Additionally, 48.40% of affected individuals were community-dwelling older adults. FOF is also recognized as a predictor of falls among community-dwelling older adults (Asai et al., 2022) and is associated with depression and reduced quality of life (Lee & Kim, 2023). Moreover, FOF has been found to predict walking and balance confidence (Lee & Tak, 2023), which in turn directly increases the risk of falling. The consequences of falls often lead to reduced mobility, which may contribute to a decline in self-management behaviors aimed at fall prevention.

Self-management is a process that empowers individuals to build life skills that reduce the impact of illness. This process requires collaboration between older adults and healthcare providers. According to Lorig and Holman (2003), self-management encompasses three key components: Medical self-management (e.g., taking medications, monitoring symptoms, engaging in physical activity), Role management (adapting to changes in health status), and Emotional management (managing emotional responses) (Lorig & Holman, 2003). Effective self-management can reduce the risk of falling (Li et al., 2019). For instance, a self-management program implemented in Mueang District, Maha Sarakham Province, led to improved fall-preventive behaviors among older adults (Teemueangsai, 2024). Similarly, Sadeghi et al. (2024) found a correlation between age and self-management behaviors among older adults with chronic conditions (Sadeghi et al., 2024). A decline in self-management impairs decision-making and may exacerbate health problems.

A review of the literature indicates that studies exploring the relationship between FOF and self-management behaviors for fall prevention among older adults remain limited. It is commonly observed that after a fall, older adults experience pain and injury, which can lead to the development of FOF due to fear

of pain. This fear often results in movement restrictions and reduced ability to carry out daily activities, leading to diminished self-esteem and a subsequent decline in self-management behaviors. These findings are consistent with Taani et al. (2022), who reported a relationship between self-management processes and physical activity (Taani et al., 2022). In Chiang Rai Province, older adults make up 26.10% of the total population, with an elderly dependency ratio of 44.3—both figures are expected to increase (National Statistical Office, 2024). Moreover, rapid economic development in the province has brought about social structural changes, necessitating older adults adapt in order to maintain their health.

Therefore, the researcher aims to investigate the relationship between Fear of Falling and self-management behaviors for fall prevention among older adults in Chiang Rai Province. The findings from this study are intended to inform people about the development of fall prevention strategies that are contextually appropriate and responsive to the unique needs of the local population.

Research Objective

This study investigated the association between Fear of falling and Self-Management Behaviors for Fall Prevention Among Older Adults in Chiang Rai Province.

Methodology

Population and Sample

Population: The population included individuals aged 60 years and older, both male and female, in Chiang Rai Province, totaling 271,888 people (Department of Older Persons, 2024). Sample: This study collected data by sampling individuals aged 60 years and older in Chiang Rai Province, the sample size was calculated using a proportional estimation formula. A sample of 377 participants and to prevent data loss, the researcher added 10 percent, resulting in a total sample of 415 participants. The researcher used a multi-stage sampling method was used as follows: 1) Sampling districts by stratified random sampling based on the size of the district in each province categorized into large, medium, and small according to the population of each district, then randomly selecting one large district, one medium district, and one small district, making a total of 3 districts. 2) Calculating the proportion of the aging population in each district. 3) Using accidental sampling for a total of 415 individuals based on the calculated numbers

Research Tools

Research Tools consist of 3 parts:

Part 1: Personal Record Form: It is a form for recording information of the sample group regarding gender, age, marital status, educational level, religion, occupation, type of residence, source of income, average monthly income, sufficiency of income, chronic diseases, history of falls during the past 6 months, location of falls, causes of falls, and fear of falling.

Part 2: The Falls Efficacy Scale International (FES-I) was developed by the European Association for the Prevention of Falls (ProFaNE) (Kempen, et al., 2007) and translated into Thai (Thai FES-I) by

Thiamwong (2011). This question consisted of about the level of fear of falling in a total of 16 different activities, which consist of Physical and social activities, both easy and difficult. The answer is a 4-point Likert scale: 1 = not at all concerned, 2 = somewhat concerned, 3 = fairly concerned, and 4 = very concerned. The total score ranged from 16 to 64 points, 16-21 points low concern fear of falling, 22 - 27 points moderate concern fear of falling, and 28-64 points high fear of falling.

Part 3: Questionnaire on self-management of fall behavior among older adults, developed from the self-management concept of Lorig and Holman (Lorig & Holman, 2003). It covers three tasks of self-management and consists of 30 items classified into three dimensions, including medical management (20 items), emotional management (5 items), and role management (5 items). Responses are rated on a 5-point Likert scale, ranging from Responses are rated on a 5-point Likert scales, rating from 1 (never practice), 2 (rarely practice), 3 (sometimes practice), 4 (always practice), and 5 (often practice). The possible score ranges from 30-150. The researcher classified the scores into 3 levels of self-management behaviors based on intervals: Low self-management behaviors (30 - 50), moderate self-management behaviors (50 - 100), and High self-management behaviors (101 - 150)

Research Tool Quality Assessment

The quality of the Self-Management Behavior Assessment for Fall Prevention in Older Adults was verified through content validity, which was evaluated by five experts. The Index of Item-Objective Congruence (IOC) ranged from 0.80 to 1.00. Additionally, the assessment was tested with a group of 30 older adults who had similar characteristics to the study sample. The Cronbach's alpha coefficient for the self-management behavior assessment was found to be 0.824.

For the Falls Efficacy Scale International (FES-I) researcher did not make any modifications, and the instruments had already undergone content validity sensitivity of 0.92 and a specificity of 0.83 which are considered acceptable

Data Collection

Data Collection Methods

1. The researcher collected data by coordinating with communities in Large District, Medium District, and Small District, Chiang Rai Province, to request permission to conduct data collection.

2. The researcher coordinated with the heads of village health volunteers in the local communities to schedule meetings with older adults to provide relevant information for the study.

3. The researcher held meetings with the older adult groups to explain the research process, objectives, and methods of data collection.

4. Data collection was conducted using a personal information record form and a self-management behavior questionnaire for fall prevention among older adults. The sample group was selected using simple random sampling (drawing lots), resulting in a total of 415 participants. The researcher and research assistants read the questions aloud to the participants, who then selected their responses. The process

began with the personal information form, The Falls Efficacy Scale International (FES-I), followed by the self-management behavior questionnaire for fall prevention among older adults.

5. After the participants completed the questionnaires, the researcher reviewed them for completeness and accuracy before proceeding with statistical analysis.

Data Analysis

The complete questionnaires were verified and analyzed as follows:

1. Personal data, Self-management behavior for fall prevention data and Fear of falling data using descriptive statistics, including frequency, percentage, mean, and standard deviation.

2. The relationship between fear of falling and self-management behaviors for fall prevention was analyzed using Pearson's correlation coefficient.

Ethics Approval

This study was approved by the Human Research Ethics Committee, Faculty of Public Health, Chiang Mai University, under the code ET01/2568.

Results

The demographic characteristics of older adults

In this study, the sample consisted of 415 older adults living in Chiang Rai Province. The majority of the participants were female totaling 58.30%. Most participants were between 60 and 69 years old, totaling 61.90%. The majority were married or had a partner totaling 65.50. Most of the participants completed primary education of 66.50% and were not working of 32.00%. The next largest group worked in farming, gardening, or rice farming (23.60%). The majority of participants (54.90%) had no chronic diseases. Among those with chronic diseases, the most common was hypertension (20.40%), and 20.20% reported taking antihypertensive medications. Most participants lived in two-story houses made of half concrete and half wood (32.30%) and were able to perform daily activities independently (66.50%). It was found that the majority of 67.20% had experienced a near-fall within the past month, while 32.80% had not. Additionally, 18.60% reported having experienced an actual fall during this period. The most common cause of falls was tripping over an obstacle, reported by 10.10% of participants.

Self-management of fall behavior among older adults in Chiang Rai province

Found that, the overall level of fall prevention self-management among older adults was at a moderate level (Mean = 2.77, S.D. = .942). When considering individual items *"Eat three balanced meals a day, ensuring a nutritious diet with the five food groups to maintain a healthy body and support your nervous system"* which was at a moderate level (Mean = 3.27, S.D. = .931). The second-highest mean score was *"Hold onto the handrail when walking upstairs or on steep ramps"* also at a moderate level (Mean

= 3.26, S.D. = .882). The lowest mean score was found *"Understand and accept the possibility of physical decline that may increase the risk of falls"* which was at a low level (Mean = 1.94, S.D. = .948).

Found that the majority of the Older Adults had a moderate level of Fall Prevention Self-management among older adults, with 376 participants, representing 90.60%. This was followed by a high level, with 39 participants, representing 9.40%, respectively. As shown in Table 1

Table 1: Number and Percentage Classified by Levels of Self-management of fall behavior (N=415)

Levels of Self-management behavioral for falling prevention	Number	Percentage
Moderate (51 - 100 points)	376	90.60
High (101 – 150 points)	39	9.40
Total	**415**	**100.00**

Found that the majority of participants had a high level of concern or fear of falling, with 294 participants (70.80%). This was followed by a moderate level, reported by 73 participants (17.60%), and a low level, reported by 48 participants (11.60%), respectively). As shown in Table 2

Table 2: Number and percentage classified by level of fear of falling (n=415)

Level of fear of falling	Number	Percentage
Low (16 – 19 points)	48	11.60
Moderate (20 – 27 points)	73	17.60
High (28 – 64 points)	294	70.80
total	**415**	**100.00**

Found that the average scores of fears of falling and self-management in fall prevention among older adults showed a statistically significant weak negative correlation (r = -0.110, p = 0.026). As shown in Table 3

Table 3: Association between fear of falling and Self-management in fall prevention among older adults

Variable	Pearson's Product Moment Coefficient (r)	P-value
Fear of falling Self-managements behavior	-.110	.026

P<.05*

Discussion

This study aimed to investigate the association between Fear of falling and Self-Management Behaviors for Fall Prevention Among Older Adults in Chiang Rai Province.

It was found that the average level of fear of falling (FOF) among the participants was moderate (Mean = 2.10, S.D. = .931). This may be attributed to the fact that most of the participants were female, which is associated with a higher incidence of FOF. The study by Bahat Öztürk et al. (2021), which examined 1,021 community-dwelling older adults aged 60 and above attending a geriatric outpatient clinic at a university hospital, found that females were 4.1 times more likely to experience FOF than males (OR = 4.1, 95% CI = 2.0–8.4, $p < 0.001$) (Bahat Öztürk et al., 2021). In addition, females are at greater risk of developing osteoporosis compared to males. Therefore, if a fall occurs, the risk of bone fractures is higher, contributing to greater FOF among females than males. This finding is consistent with the study by De Roza et al. (2023), which examined older adults aged 65 and above from four primary care clinics in Singapore (n = 360). It was found that 68.4% of females had high FOF, compared to 49.7% of males (De Roza et al., 2023). Similar results were found in the study by Martínez-Arnau et al. (2021), which focused on prefrail and frail older adults aged 70 and above in primary care and social centers for older adults in La Ribera, Valencia, Spain. The study covered 229 communities with a total of 220,676 older adults and found that most participants had a moderate level of FOF, with higher FOF levels observed in females (Martínez-Arnau et al., 2021). The study also found that most participants were in the early old-age group who were still able to care for themselves and continue working. Age was found to be a significant predictor of fear of falling (Zareipour et al., 2020), as aging is associated with physical decline, particularly in balance control, increasing the risk of falls and, consequently, higher levels of FOF (Vaishya & Vaish, 2020).

It was found that the overall mean score for self-management behavior for fall prevention among older adults in Chiang Rai was at a moderate level (Mean = 2.77, S.D. = 0.942). This finding aligns with the observation that most participants were in the early elderly stage (60–69 years), many of whom were still working and earning their own income. This likely contributed to lower levels of attention to health care since their physical condition was still strong and they could independently manage their daily activities. When examining individual items, the statement *"Eat three balanced meals a day, ensuring a nutritious diet with the five food groups to maintain a healthy body and support your nervous system"* had the highest mean score, at a moderate level (Mean = 3.27, S.D. = 0.931). It was found that most participants could still care for themselves and lived with their spouse (65.5%). This finding is consistent with Penpo (2020), who studied Factors Related to Health Promotion Behaviors of the Elderly in Wangsaiphun District, Phichit Province among 370 older adults. The study found that marital status was significantly associated with health promotion behaviors at the 0.05 level (Penpo, 2020).

The item *"Hold onto the handrail when walking upstairs or on steep ramps"* had the second-highest mean score, also at a moderate level (Mean = 3.26, S.D. = 0.882). This corresponds with findings that although most participants could care for themselves, 53.00% were still at risk of falling, and 67.20% experienced a near-fall. A near-fall, indicating a temporary loss of balance, is a predictor of future falls

(Leng-Hsien Soh et al., 2021). Notably, the item *"Understand and accept the possibility of physical decline that may increase the risk of falls"* had the lowest mean score, at a low level (Mean = 1.94, S.D. = 0.948). This reflects the fact that aging is naturally associated with physical deterioration and reduced mobility, which can lead older adults to feel that their physical condition is no longer the same. This finding aligns with the observation that 45.10% of participants had chronic diseases such as hypertension and diabetes, with more than half having multiple chronic conditions, which are associated with an increased risk of falls. Additionally, most participants were female, and it is known that older women with decreased physical activity levels tend to have a higher prevalence of falls than men (Tsai et al., 2024). This is consistent with the study by Chotigawin et al. (2023), which investigated Factors Affecting Fall Prevention Behaviors Among the Elderly in Ban Mai Subdistrict, Mueang District, Nakhon Ratchasima Province among 162 older adults. The study found that most participants had a moderate level of belief in fall prevention (59.88%) and that this belief was significantly associated with and could predict fall prevention behaviors, indicating the importance of motivating behavioral change (Chotigawin et al., 2023).

The study found that Fear of Falling (FOF) was significantly and negatively correlated with self-management behaviors for prevention among older adults, although the correlation was weak ($r = -0.110$, $p = .026$). The findings of the present study are consistent with previous research. Most participants were able to perform self-care activities independently; however, they still reported a high level of fear of falling. This may be explained by the fact that 67.20% of the participants experienced a near-fall within the past month, in combination with age-related physical decline and the presence of chronic diseases (45.10%). These factors may negatively affect confidence in mobility and balance, leading older adults to avoid certain activities despite maintaining functional independence. Accordingly, the majority of participants in this study reported a high level of fear of falling (70.80%). Consistent with the findings of the present study, most participants were able to perform self-care independently; however, they continued to experience a high level of fear of falling. This may be explained by the fact that 67.20% of the participants experienced near-fall within the past month, in combination with age-related physical decline and the presence of chronic diseases, which were reported by 45.10% of the samples. These factors adversely affect confidence in movement and balance, leading to activity avoidance despite the ability to remain functionally independent. This is consistent with the finding that the majority of participants reported a high level of fear of falling (70.80%).

The results further demonstrated that fear of falling was significantly associated with self-management behaviors for fall prevention; however, the strength of this relationship was low. This weak correlation may be attributed to the fact that, although participants experienced fear of falling, they were still able to care for themselves and maintain a relatively high level of independence, which limited the direct impact of fear on self-management behaviors. In addition, fear of falling does not operate in isolation but interacts with other factors such as self-efficacy, social support, and previous experiences, all of which may influence self-management behaviors for fall prevention. These findings are consistent with those of Tinetti et al. (1990), who defined fear of falling as a persistent concern about falling and a perceived lack of

confidence that leads individuals to avoid activities, they are still physically capable of performing (Tinetti, Richman, & Powell, 1990). Furthermore, the present results align with the study by Kouchaki et al. (2023), which reported significant negative correlations between fear of falling and self-care behaviors overall ($r = -0.19$), as well as psycho-emotional ($r = -0.44$), social ($r = -0.40$), and daily self-care behaviors ($r = -0.46$) ($p < 0.05$) (Kouchaki et al., 2023). When older adults experience FOF, it can lead to limitations in performing daily activities due to avoidance behaviors stemming from fear. This avoidance also affects their participation in social activities, which contributes to a decline in quality of life (Schoene et al., 2019).

FOF also leads to reduced self-confidence and heightened anxiety, which may progress to depression (Keski et al., 2025). When older adults lack confidence in performing daily activities, their ability to manage themselves effectively is compromised. These findings are consistent with those of Sadeghi et al. (2024), who reported that self-efficacy and engagement in daily routines support self-management (Sadeghi et al., 2024). A high level of FOF, therefore, contributes to limitations in daily living, fosters dependence, and directly impairs self-management among older adults. The results of this study align with those of Naveed et al. (2024), who conducted a descriptive cross-sectional study involving 99 older adults aged 65–74 years. The study, which was approved by the Ethical Committee of the Lahore College of Physical Therapy, found that participants with lower scores on the Fall Efficacy Scale (FES)—indicating higher fear of falling—had significantly higher scores on the Functional Independence Measurement (FIM). A strong, statistically significant negative correlation was observed ($r = -0.750$, $p = .000$), suggesting that higher FOF is closely associated with reduced functional independence (Naveed et al., 2024).

These findings highlight the importance of incorporating FOF assessments into fall prevention planning. Addressing FOF can increase awareness and understanding of the issue, enabling older adults to make informed decisions regarding appropriate coping strategies. This process supports goal setting and fosters behavioral changes conducive to fall prevention, ultimately reducing fall risk and enhancing the quality of life among older adults.

Conclusion

This study was a cross-sectional study on the relationship between Fear of falling and Self-Management Behaviors for Fall Prevention Among Older Adults. The findings revealed a low-level relationship. Future research should explore in-depth interviews or investigating biosocial factors related to self-management and Fear of falling, in order to better understand the context and challenges of fall-prevention behaviors and to promote appropriate fall-prevention practices.

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