Factors Associated with Fall Prevention Behaviors among Elderly in Ban Na District, Nakhon Nayok Province, Thailand

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Abstract

The descriptive survey study research. The objectives to study fall prevention behaviors of the elderly, and to study factors related to fall prevention behaviors of the elderly in Ban Na District, Nakhon Nayok Province. In this study, the purposive sampling was used to recruit 118 elderly samples. The questionnaire was used as a tool to collect employed quantitative data. The content validity was improved and adjusted by the suggestion of the expert. Using Cronbach's alpha coefficient tested the reliability of the assessment tools. Health beliefs questionnaire was 0.95 level and Falling prevention behaviors questionnaire were 0.82 level. Data analysis was done by computer program. Statistic was to acquire frequencies, percentage, means, standard deviation, maximum, minimum, Chi-square test and Pearson's product moment correlation coefficient for statistically significant at 0.05 level.

The result of this study showed that the fall prevention behaviors of the samples in Ban Na District, Nakhon Nayok Province was at a moderate level 62.71% ($\bar{x}$= 52.31, S.D.=3.62 Min. = 40, Max. = 60) and overall perceive falls factors were at a moderate level 72.04% ($\bar{x}$2=164.88, S.D.=16.25, Min. =121, Max. =211). The study was also found that personal factors; education (x^2=15.73, p-value=0.000) congenital disease (x^2=8.89, p-value=0.012) were significantly associated with associated with behaviors falls prevention. The perceive susceptibility (r=0.206, p=0.025), perceived benefits (r=0.279, p=0.002 and overall perceive falls factors (r=0.236, p=0.010) were positive relationship at a low level with the behavior of fall prevention of the elderly significant at <.05.

In conclusion, promoting fall prevention should focus on improving health beliefs and awareness, especially for older adults with chronic conditions and lower educational backgrounds. Future interventions should target self-efficacy and perceived barriers to enhance effectiveness.

Keywords: Elderly, Prevention Behavior, Falls, Health Beliefs, Perceived

1. Introduction

Thailand has now officially entered the stage of a Complete Aged Society and ranks third globally and second in ASEAN (after Singapore) in terms of the speed of aging population growth (Foundation of Thai Gerontology Research and Development Institute, 2022). In 2022, Thailand had a total population of 66 million, with over 12.6 million elderly people—accounting for 19.21% of the total population. It is projected that within the next 20 years, the overall population growth rate will

decline to the point of being negative, while the proportion of elderly individuals will continue to rise rapidly (Foundation of Thai Gerontology Research and Development Institute, 2022).

In 2021, data revealed that the leading external cause of illness among Thai elderly was falls, with 58,672 cases, equating to a rate of 492.96 per 100,000 people (Ministry of Public Health, 2021). A fall refers to a sudden descent or collapse due to a loss of balance (American Geriatrics Society, 2020). Falls are a common problem among the elderly and can lead to serious consequences, both physically and psychologically. These include bone fractures, disabilities, and in some cases, death. Such incidents can result in psychological distress, particularly a loss of confidence in performing daily activities. A condition known as "fear of falling" occurs in approximately 33% of older adults after a fall, leading to reduced self-efficacy, avoidance of activities, and decreased confidence in daily living (Tinetti & Powell, 1993). This may ultimately result in social withdrawal, anxiety, stress, and depression (American Geriatrics Society, 2020).

The quality of life for elderly individuals who have experienced falls tends to decline significantly. Risk factors include increasing age, female gender, impaired mobility and balance, chronic illnesses, and environmental hazards at home or in the community (World Health Organization, 2007). Given these concerning trends, the researcher recognizes the growing elderly population and the negative impacts of falls—ranging from physical disabilities, psychological trauma, to fear of activity after fall-related injuries. This study applies the Health Belief Model (HBM) (Rosenstock, I. M., 1974) to explore how perceptions and beliefs influence prevention behaviors among elderly. The goal is to identify key perceived factors and relationships that influence fall prevention awareness. Furthermore, the findings could serve as a foundation for the development of tools aimed at fall prevention in the elderly. Objectives to study the level of fall prevention behaviors among elderly and to examine the factors associated with the level of fall prevention behaviors elderly in Ban Na District, Nakhon Nayok Province.

2. Methods

The sample group in this study consisted of 834 socially active elderly, both male and female, aged 60 years and above, residing in Phikun Ook Subdistrict, Ban Na District, Nakhon Nayok Province.

2.1 Research Design

This research is a descriptive survey study aimed at examining fall prevention behaviors and the factors associated with fall prevention behaviors among elderly in Ban Na District, Nakhon Nayok Province.

2.2 Participants and Procedures

The sample size was calculated using the G*Power program. Pearson correlation was employed to test the relationships, and the sample size was increased by 5% to account for possible data loss or incomplete responses. Therefore, the total sample size was 118 participants.

2.3 Instruments and Materials Used

The research employed a questionnaire composed of three sections:

Section 1: General demographic information, consisting of 8 items in multiple-choice and fill-in-the-blank formats. These included gender, age, education level, marital status, household composition, occupation, underlying diseases, and history of falls.

Section 2: A questionnaire on perceived factors regarding falls in the elderly, consisting of 43 items. This section covered five domains: perceived susceptibility to falling (8 items), perceived severity of falling (8 items), perceived benefits of fall prevention (10 items), perceived barriers to fall prevention (8 items), and perceived self-efficacy in fall prevention (9 items).

Section 3: A questionnaire assessing fall prevention behaviors among elderly. This section used a 20-item scale developed by Supatsorn Boonkrappuang (Supatsorn Boonkrappuang, 2022). The interpretation of fall prevention behavior scores was based on this instrument.

The questionnaire underwent content validity review by three experts and reliability testing through a pilot study with 30 elderly living in the service area of Ban Khlong 23 Health Promoting Hospital, Sisa Krabue Subdistrict, Ongkharak District, Nakhon Nayok Province. The pilot group had characteristics similar to the target population. Reliability was measured using Cronbach's Alpha Coefficient, which yielded values of 0.95 for perceived health belief model constructs and 0.82 for fall prevention behavior.

2.4 Data Analysis

In this study, the level of statistical significance was set at 0.05. The data analysis was divided into two parts:

1. Descriptive statistics included frequency distribution, percentage, mean, standard deviation, maximum, and minimum values. These were used to describe personal information, perceived factors, and fall prevention behaviors among the elderly.

2. Inferential statistics included the Chi-square test, conducted at a 95% confidence level, used to examine the relationship between various factors and the level of fall prevention behaviors among the elderly. The Pearson correlation test was employed to assess the relationship between different factors and the level or score of fall prevention behaviors among the elderly.

2.5 Ethical Considerations

The researcher prioritized the rights of the research participants by clearly explaining the objectives and procedures of the study. Participation in the research project was entirely voluntary, and participants had the right to withdraw at any time. All data obtained from the participants was kept confidential and used solely for research purposes.

3. Results and Discussion

Part 1: General Information

The majority of the participants were female (62.71%), aged between 60–69 years (55.93%), (Mean =70.52, S.D. = 7.94, Min. = 60, Max. = 91) and married (55.93%). Most of them had an education level below a bachelor's degree (64.41%), having completed primary education (35.60%). They were mainly retired government officers (38.14%) and lived with their family or children (44.91%). The majority had at least one chronic illness (74.58%), with 44.07% having one chronic disease, and 73.73% reported no history of falls in the past 6 months.

Part 2: Fall Prevention Behaviors Among the Elderly

The overall fall prevention behavior among the elderly was at a **moderate level**, followed by a **low level**, and the **high level** was the least common (Mean =52.31, S.D. = 3.62, Min. = 40, Max. = 60), details are shown in Table 1.

Table 1: Number and Percentage Classified by Level of Fall Prevention Behavior among the Elderly

Level of Fall Prevention Behavior	Frequency (persons)	Percentage(%)
High (score > 55.93)	21	17.80
Moderate (score between 48.69 – 55.93)	74	62.71
Low (score < 48.69)	23	19.49

(Mean =52.31, S.D. = 3.62, Min. = 40, Max. = 60)

The top fall prevention behaviors practiced by the elderly in Ban Na District were: Keeping floors dry and asking household members to wipe wet surfaces ($\bar{x}$ = 2.94, S.D. = 0.24), details are shown in Table 2

Table 2: Fall Prevention Behaviors Among the Elderly in Ban Na District

Fall Prevention Behavior	Mean ($\bar{x}$)	S.D.
Keeping floors dry and asking others to wipe wet floors	2.94	0.24
Keeping bathroom floors clean and dry	2.92	0.28
Fixing or reporting hazardous items at home	2.92	0.28
Using flashlight or lights in dark walkways	2.87	0.36

Part 3: Health Belief Factors Related to Falls Among the Elderly

Elderly's' knowledge regarding fall prevention was assessed across five dimensions and found to be at a moderate level overall, with scores ranging from 148.62 to 181.13 points (72.04%). This was followed by those at a high level with scores above 181.13 points (15.25%), and those at a low level with scores below 148.62 points (12.71%), details are shown in Table 3.

Table 3: Number and percentage classified by levels of perception regarding fall prevention in the elderly across five dimensions

Level of Fall Prevention Behavior	Frequency (persons)	Percentage(%)
High (score > 181.13)	18	15.25
Moderate (score between 148.62 – 181.13)	85	72.04
Low (score < 148)	15	12.71

(Mean =164.88, S.D. = 16.25, Min. = 121, Max. = 211)

It was found that the highest mean score was for perceived benefits of self-protection ($\bar{x}$ = 39.40, S.D. = 4.67), while the lowest mean score was for perceived severity of falling ($\bar{x}$ = 30.02, S.D. = 4.37), details are shown in Table 4.

Table 4: Levels of Health Beliefs Regarding Falls Among the Elderly in Ban Na District, Nakhon Nayok

Health Belief Factors	Mean ($\bar{x}$)	S.D.	Interpretation
Perceived susceptibility	30.52	4.27	Moderate
Perceived severity	30.02	4.37	Moderate
Perceived benefits	39.40	4.67	Moderate
Perceived barriers	30.36	4.08	Moderate
Perceived self-efficacy	34.58	3.59	Moderate

Part 4: Relationship Between Personal Factors and Fall Prevention Behaviors

A chi-square test (χ^2-test) showed that educational level and chronic diseases were significantly associated with fall prevention behaviors among older adults at a statistical significance level ($\chi^2 = 15.736$, $p = 0.000$; $\chi^2 = 8.898$, $p = 0.012$). Other factors such as gender, age, marital status, occupation, household members, and history of falls within the past six months were not significantly associated with fall prevention behaviors. Details are shown in Table 5.

Table 5: The relationship between personal demographic factors and the level of fall prevention behavior among the elderly.

Personal Factor	Chi-square(χ^2)	df	p-value
Gender	3.541	2	0.178
Marital status	0.444	2	0.801
Education level	15.736	2	0.000*
Occupation	0.767	2	0.681
Living arrangement	4.633	2	0.099
Chronic illness	8.898	2	0.012*
Fall history (6 months)	0.285	2	0.867

$*p < 0.05$

Pearson's correlation analysis revealed that age was **not** significantly associated with fall prevention behaviors ($r = 0.157$, $p = 0.089$). See Table 6.

Table 6: The correlation coefficient between the personal factor (age) and fall prevention behavior scores among the elderly.

Personal Factor	r	p-value
Age	0.157	0.089

** p < 0.05*

Part 5: Relationship Between Health Beliefs and Fall Prevention Behaviors

Overall health perception, perceived susceptibility to falls, and perceived benefits of fall prevention were positively correlated at a low level with fall prevention behaviors and were statistically significant (r = 0.236, p = 0.025; r = 0.206, p = 0.025; r = 0.279, p = 0.002). Other perceptions such as severity, barriers, and self-efficacy were not statistically significant. See Table 7.

Table 7: The correlation coefficient between health perception scores and fall prevention behavior scores among the elderly.

Health Belief Factor	r	p-value
Overall health beliefs	**0.236***	**0.025**
- Perceived susceptibility	0.206*	0.025
- Perceived severity	0.116	0.211
- Perceived benefits	0.279*	0.002
- Perceived barriers	0.126	0.173
- Perceived self-efficacy	0.176	0.053

** p < 0.05*

4. Conclusion

This study found that elderly individuals in Ban Na District, Nakhon Nayok, exhibited a moderate level of fall prevention behavior. Significant personal factors related to this behavior included education level and chronic illnesses. Additionally, certain health perceptions—such as perceived risk and perceived benefits of prevention—were positively associated with fall prevention behaviors. These findings highlight the importance of enhancing awareness and tailored education to effectively promote fall prevention among the elderly.

5. Discussion

This study examined factors associated with fall prevention behavior among elderly individuals in Nakhon Nayok Province. Results showed that overall fall prevention behavior was at a moderate level, consistent with Kaewthong and Chaiyawat (2022) and Saengwong (2021), but differing from Wongwanich (2020), who reported higher levels. Among personal factors, only

educational level and chronic illness were significantly associated with fall prevention behaviors. This aligns with findings by Boonkrabpuang (2020) and Thanachart (2021), indicating that higher education and disease awareness promote better preventive behavior. Regarding health belief factors, perceived susceptibility and perceived benefits were positively associated with fall prevention behavior, in line with the Health Belief Model and supported by Srisawat and Wongyai (2020). However, perceived severity, perceived barriers, and self-efficacy showed no significant correlation. This may result from limited health literacy and fall-related experiences among the elderly participants.

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