

Effects of self-care on fall prevention program for older adults in a community, Nakhon Pathom Province, Thailand

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Abstract

Falling is one of the major risks in older adults causing serious health problems. The purpose of this quasi-experimental study was to examine the effects of a fall preventing program based on Orem's self-care theory. Thirty older adults over 60 years of age living in Ban-nai village were invited to participate and signed consent form in the study. The three weeks of fall preventing program consisted of daily exercise for balancing and strengthening of legs muscles, creating a protective home environment, and education on side-effects of daily medications. Data were collected before and after the intervention program including socio-demographic data, capacity of self-care on fall prevention, risk of fall (TUGT-Time up and Go test). Data analysis was performed using a descriptive analysis and paired t-test.

The results revealed that after older adults received the program, their capacity of self-care on fall prevention were significantly higher than pretest (p -value = 0.01). While the mean scores of fall risk in aging were lesser than pretest (p -value = 0.000). Therefore, this Self-care Promoting on Fall Prevention program for older adults might be applicable for District Health Promotion Hospital.

Keywords: fall prevention program, older adult, community

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1. Introduction

As aging population trend increase worldwide, Thailand population has also changed its aging society, and will become a super aged society in the year 2036 which mean that people aged 65 and over about 20% of the population [1]. Falling is one of the most common risk causing serious health problems. World Health Organization (WHO) indicated that people aged over 65 trended to fall 28-35 % and will increase to 32-42 % when they are over 70 years old, commonly observed among aging people who had weak muscles, non-communicable diseases, diabetes, hypertension, paralysis, loss of coordination balance, and visual impairments [2, 3]. One third of 65 and older persons tend to fall one or more times every year. Falls are not only leading the cause of morbidity and mortality, but also burden to the family and increase medical expenses. The estimate cost of hospital care for fall-related injuries in Australia was \$566 million [3]. Moreover, the indirect and intangible costs or lifetime cost; for example, pain, suffering, loss independence and productivity are all associated with falls. In Thailand, falling is a leading cause of injuries, accounted for 40% among older adults [4]. Therefore, falls among aging are an important public health issue. There are two factors associated to falls: intrinsic factors

and external factors. The intrinsic factors are caused by physical changes, increase patho-logical condition, balance deficit, visual impairment, over-weight or underweight, and bone and muscle disease [5]. The external factors or environmental factors, including the arrangement of furniture and objects blocking the pathway, wet floors, inadequate lighting, broken stairs, and trying to get the objects that are out of reach. There were many intervention programs on population-based approach to decrease falls in commu-nity among aging population that are effective group exercise in preventing falls such as Tai Chi, yoga, dancing and physical training to improve performance on some test of physical function that were risk factors for falls [6 - 8]. However, there were still unclear explanation on the impact of exercise training [7].

During a survey in community nursing practicum of nursing students at Ban-nai, Sakatiem, an aging society community in Nakhon Pathom province, had 483 residents and there were 83 (17.39%) who were over 60 year of age. Half of them had some diseases including; hypertension, diabetes, muscle or bone diseases. They took at least 2 types of medicine that may have side effects on their coordination balance. All older adults may have risk for fall and consequences, so the

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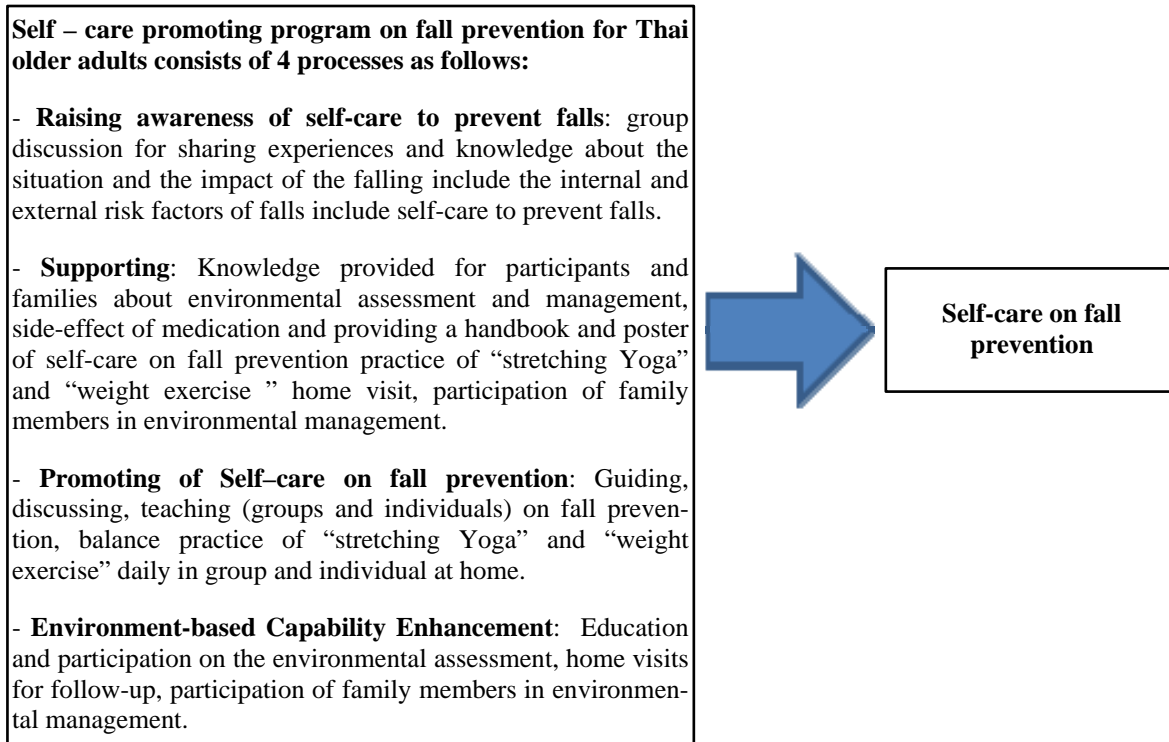


Figure 1 Conceptual Framework of the study

stakeholders in community decided to prevent fall among aging individual. The researchers applied studying a self-care promoting program on fall prevention among aging based in Orem’s self-care theory. According to this theory, the researchers investigated universal self-care requisites, the health deviation self-care, and educational system and partly compensatory system which was self-care education, or in cases when the participants were not able to practice self-care for fall prevention [8]. Self-care is an important life-style for aging to become independent and reliant to be able to perform their daily errands and prevent fall. Many researches revealed that the nursing process using self-care theory in supporting and providing knowledge to the elderly had higher mean score of self-care for fall prevention after the intervention program [8]

2. Objective

To study effects of a self-care promoting program on fall prevention among Thai elderlies in a community.

3. Research Hypotheses

1. The elderlies who attended the intervention had significantly higher average scores of self-care on fall prevention than before the intervention program.
2. The elderlies who attended the intervention had significantly lower average scores of risk of fall

(TUGT-Time up and Go test) than before the intervention program.

4. Population and Sample

The population in this study was Thai older adults with risk of falls, who were 60-80 years old and resided in Ban-nai village, Sakatiem district, Nakhon Pathom province. Samples were recruited by purposive sampling. Samples were recruited by the inclusion criteria including; male and female older adults can do daily activities had Barthel’s Index ADL score more than 12; had risk for fall score 4-11 by Thai Fall Risk Assessment tool (FRAT) [9]; no dementia or disabilities; can verbal communicate, read and write Thai language; and decide to participate in the study by signing an informed consent form. The exclusion criteria were participant who was sick and admitted in a hospital and could not attend the program more than 3 times. The discontinuation criteria were participant who move out from the village and want to withdraw from the study.

5. Materials and methods

This study was a quasi-experimental design with a one group pretest-posttest design. The purposive samples were 30 Thai elder adult aged more than 60 years old who were living in Ban-nai village, Sakatiem district,

Nakhon Pathom province. The participants were provided with the self-care promoting program on fall prevention, and 3-weeks program, including raising awareness of self-care to prevent falls, group discussion, information regarding the meaning and effects of falling, risk factors, promoting of self-care on fall prevention, side-effect of medication and providing a handbook of self-care on fall prevention, assessment on management home environment, skill practice for balancing exercise such as “stretching yoga” and “weight exercise” for legs, and home visit. Data collection was performed during pretest and posttest after the completion of the intervention.

6. Research Instruments

The instruments study consisted of three parts.

Part 1 The screening instruments: Barthel’s Index, Time Up to Go Test (TUGT) and Thai Fall Risk Assessment tool (FRAT) [9]

Part 2 The intervention instrument: A self-care promoting program on fall prevention: The handbook of self-care on fall prevention, assessment-management home environment, skill practice for balance exercise by “stretching yoga” and “weight exercise” for legs.

Part 3 The instruments for data collection:

1. Questionnaires

1.1 A Questionnaire on general history such as the socio-demographic characteristics of the Thai older adults with risk of falls.

1.2 A Questionnaire on self-care on fall prevention. Three parts of which consisted of 29 questions using a rating scale from one (never) to three (every time). Range of scores was 29-87. The content of the questionnaires was validated by three experts, CVI = 0.78. After which the questionnaire was tested for face validity by five Thai aging with risk of falls. The revised questionnaire was completed by 30 Thai older adults with risk of falls who had similar characteristics to the participants, before being provided to the participants in this study. Reliability was examined by using Cronbach’s Alpha Coefficient and was 0.76.

7. Data Analysis

Data was analyzed by computer a program.:

1. Socio-demographic data was analyzed and presented by frequency, percentage, mean, mode, and standard deviation.

2. Comparison of the study variables between pretest and posttest average scores within the group was done by using paired t-test.

8. Results

Socio-demographic characteristics data

The sample group had an average age of 75.91 ± 4.21 years. Most of aging samples were female (73.3%),

had a primary or secondary level of education (70%), had job (91.4% and 82.0 %, respectively), had majority income from earning a living and the cowrie support life (57.1 % and 51.4 %, respectively), the character residence was second-storied (83.3%) lived with a wife or in extended family (50% and 50 %, respectively), had chronic disease which metabolic disease(36.7%), and had used drug more than 1 types (66.7%).

Hypotheses testing results

Hypotheses for this study were tested and the results are revealed as follows. The summary of the results are shown in Table 1.

Self-care on fall prevention

After the intervention, the sample group had significantly greater average scores of self-care on fall prevention than before the intervention ($t = -2.74$, $df = 29$; $p < 0.05$) (Table 1).

9. Conclusion and Discussion

This research was aim to study the effects of a self-care promoting program on fall prevention among older adult in a community. The study revealed that, the self-care promoting program on fall prevention among aging had significantly higher scores in post-intervention than before intervention ($p < 0.05$). The increasing scores resulted from an implementation of self-care promoting program on fall prevention and the self-care deficit which is one of the main nursing concepts of Orem [10].

The three procedures were applied for activities. First, **the awareness of self-care promoting program on fall prevention**, the participants were provided about the fall situation in aging, risky factor leading to falls (intrinsic factors and external factors including other possible impacts or danger caused by falling [10]. The participants were encouraged to participate in the group discussion so that they could share their experience on falling caused by the inappropriate self-care including the impacts of falling the aging population experienced. In addition, the participants could make their decisions on the fall prevention better based on their level of understanding and experienced. In accordance to the facts of Orem’s self-care concept, it was stated that individuals could take care of themselves best when they had knowledge on themselves and the surrounding environment. Therefore, having knowledge led to efficiency and desirable achievement. The knowledge on internal and external circumstances was in promoting self-care [10]. Nurses commonly used the managing together with the supporting.

Second, **supporting** was provided in the intervention as follows: 1) Supporting of knowledge and education on self-care promoting program on fall prevention in terms of general care, developmental-stage care and health-focused care; 2) Supporting of physical balance practice under a supervision of volunteers or mentors. The

Table 1 Comparison of average scores of self-care on fall prevention of the sample group before and after intervention (n = 30)

	Mean	df	sd	t	p-value
Before intervention	56.00	29	10.18		
After intervention	58.47	29	11.56	-2.74	0.01*

* $p\text{-value} < 0.05$

The risk of fall (TUGT-Time up and Go test) the sample group had lower time average scores of TUGT than before the intervention ($t = 4.15$, $df = 29$; $p\text{-value} < 0.000$) (Table 2).

Table 2 Comparison of average scores of risk of fall (TUGT-Time up and Go test) of the sample group before and after intervention (n = 30)

	Mean	df	sd	t	p-value
TUGT pretest	22.37	29	10.29		
TUGT posttest	18.43	29	7.31	4.15	0.000**

$p\text{-value} < 0.01$

exercise in this study was easy and can be performed at home by the older adults during their free time. Thus, the balance exercise is very essential for the older adults; 3) The manual of self-care promoting program on fall prevention was provided for the participants so that the older adults can read and practice at home; 4) The home visit was conducted by volunteers for environmental assessment and improvement; 5) The health care volunteers and family members voluntarily participated in the environmental management; 6) The spiritual encouragement and compliment also given.

Third, **the skill enhancement** should be done through teaching and practicing so that the aging population could gain knowledge, make better decisions and prevent themselves more effectively from falls at home. This finding was in accordance with the fact of Orem's self-care theory [12, 13]. To take care of oneself continually and efficiently, the nurses played a great role because they could provide proper knowledge and understanding on patient's circumstances. As such, the patients could make better decisions on self-care. The participants were encouraged to learn from the group participation and discussion. During the first activity, the participants were asked to observe and assess their own home using the Check for Safety: A Home Fall Prevention Checklist for Older Adults. The literature review was also applied in accordance with the contexts and culture of the participants. The group activity encouraged aging to express their opinions and gain direct learning. Additionally, the balance exercise should be taught [14, 15]. The older adults were trained under a supervision of the volunteers or mentors. According to the literature review, there are several kinds of balance practice that can be used to prevent the older adults from the falls such as Chinese "Ti Kek" and "Ti Chi" practice [13, 17] and, in particular, Yoga

practice. The group practice is required and the practice should be at least 3 times a week (an hour for the session) for 3 weeks to improve the physical balance [12]. By these reasons, Yoga is suitable for the older adults. As the "stretching yoga" and "weight exercise" practice was used instead on the fall prevention [14]. The "stretching yoga" and "weight exercise" practice is very ideal for the older adults because it is easy to follow, requires only a few stuffs, and can be performed at home while doing other activities such as watching TV or listening to a radio. The "stretching yoga" and "weight exercise" for legs and practice should be done 30 minutes per session and at least one times a week. The exercise results should be regularly recorded in the self-care manual on fall prevention for further reference [18].

The **environment management** is also important and can motivate the participants with the proper goal-setting. Environmental management here also includes the change of attitude and self-care awareness. The environment management usually conducted with other techniques like teaching [10, 21]. According to Orem, human beings and environment are independently influenced and cannot be separated [8]. According to literature review, the environment or the external factors are the main causes of falling among the older adults, accounted for 51% [17]. By this study, the participants were encouraged to realize the importance of external risky factors. In addition, the health volunteers participated in the home visitation to provide more knowledge for the older adults. However, the memorization may not work for the older adults especially those aged over 70 years old due to their deteriorating memory status [20]. It was found out that upon applying the self-care promoting program on fall prevention, the older adults having risks of falling could take care of themselves and also prevent themselves from falling.

Research Application

1. This self-care promoting program for fall prevention among aging can be provide for primary service health care such as care providers who are involved with the older adults in promoting the health care and improving their quality of life.

2. The activities related to the self-care promoting program on fall prevention should be organized in accordance with the way of life of the older adults and the operation of the health officers in the community. The home visitation is also suggested for adapting and modifying in compliance with the lifestyle and living environment of the older adults properly.

3. The research findings should be informed to the community administrators for establishing the policy of health care promotion or integrating long-term care to cope with an increase of older adult population and fall issues.

Further Study Recommendations

1. The self-care promoting program on fall prevention should be assessed or integrated to the other groups of patients suffering from chronic diseases, mental deficit, physical disability.

2. The comparison group for two groups of pretest and posttest in quasi-experimental design should be conducted for validity of study.

3. Mixed method of qualitative and quantitative should be assessed to develop fall prevention in community integrating participatory of stakeholders such as older adults, family members, health volunteers, local administrators, and health officers.

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