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A pilot study on the effects of the 6-week recreational activities program on physical fitness of elderly people in Maeka subdistrict, Phayao provinceKritsada Tampradit¹, Pattawan Lapo¹, Apiruck Wonghempoom¹ and Prachya Wangtrakul^{1*}¹School of Science, University of Phayao, Phayao, Thailand*Corresponding author: prachya.wa@up.ac.th

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Abstract

The purpose of this study was to investigate the effect of 6-week recreational activities program on elderly people physical fitness and to compare their physical fitness with standard physical fitness testing criteria before and after participating in the 6-week recreational activities program. The recreational activity program was conducted 3 days per week for 60 min per day. The participants were 20 healthy older women, who volunteered to participate in this study by using the purposive sampling method. The participants were divided into 2 groups (60-64 years old group and 65-69 years old group). The health-related physical fitness of people age between 60-69 years old test developed by Department of Physical Education was used as protocols in this study. Descriptive statistics (mean and standard deviation) and a paired-sample t-test were used to analyze the data at the significance level of 0.05. The results showed that the physical fitness testing scores of participants increased significantly after engaging in the program, with a statistically significant at the .05 level before and after the program. Therefore, it was concluded that the 6-week recreational activities program could improve health-related physical fitness in elderly people.

Keywords: Older people, Physical activities, Recreation, Well-being

1. Introduction

Thailand is transforming into an aging society, as is occurring in many nations around the globe. The Thai population aged over 60 has been increasing at a faster pace when compared to other age groups [2,8]. This growth in the aging population has raised many concerns, particularly in terms of health (e.g. vasoconstriction, sedentary lifestyle, and high blood pressure), as well as social and economic issues. [3]. As noted by Jai-Oon, C. [4] and Samerchua, W., Pharatpariyad, Singmanee, C. and Suksatit, B. [13] Phayao province in northern Thailand is no exception to this trend. As one of the five provinces with the largest aging population in Thailand, Phayao is facing a decline in the quality of life for the elderly. For instance, the number of cases of non-communicable diseases (NCDs) is growing directly contributing to a deterioration in physical health, mental health, and social activities in their daily routines [2,3,8]. This aging group requires more basic health care, health services, recreational, and physical activities that support their well-being. [1,8]. Insufficient physical activity in older people can lead to illness and death caused by NCDs [8]. To prevent such issues, physical recreational activities are one of the most suitable approach for the elderly to maintain their physical fitness at a healthy level and keep their mind and attitude relaxed and positive [2,5], [14,17,18]. Some examples of recreational activities include outdoor activities, rhythmic activities, hobbies, socializing, arts and crafts, sports, Thai folk games, and community services [7,9], [12,15].

Appropriate physical activities can help improve physical fitness for better health and prevent older people from NCDs, falls or other accidents, and suffering from depression, all of which are the main causes of disabilities and death in the elderly [6,11,19]. The University of Phayao has long recognized and acknowledged the importance of elderly people as productive human resources for the country. Therefore, improving quality of life for the elderly people has become one of the University's key policies and aligns with its mission statement,

“Wisdom for Community Empowerment”. This mission emphasizes providing academic services and sharing knowledge with the community to enhance the lives of people from all age groups, especially the elderly people [16].

The Meaka Subdistrict is one of rural areas surrounding the University of Phayao, has seen growing elderly population. However, there is still inadequate promotion of exercise activities and there is lack of studies focused on elderly people in these communities. Recreational activities are a very beneficial option for the elderly to engage in during their free time, providing enjoyment, enhancing happiness and positively impacting both physical and mental health. For example, developing emotions and feelings, social relations and self-worth [19]. Furthermore, participating in activities allows elderly people to feel connected to their community and society, leading to an improved quality of life and holistic health development. The authors recognize the importance of recreational activity programs in enhancing the physical fitness of elderly people in Maeka Subdistrict, Phayao province. The objective of this study was to conduct a pilot study to investigate the effect of 6-week recreational activities program and to compare participants' physical fitness with standard physical fitness testing criteria before and after participating in the 6-week recreational activities program in order to emphasize the importance of providing opportunities for the elderly to participate in physical activities and improve their quality of life as well as meet their basic human needs.

2. Materials and methods

2.1 Participants

The participants in this study were 20 healthy older women age between 60-69 years old recruited from 18 villages in Maeka Subdistrict, Phayao Province. They volunteered to participate in the study through the purposive sampling method [6]. The participants were divided into 2 groups (10 participants of 60-64 years old group and 10 participants of 65-69 years old group) and all participants were required to complete the general health assessment and had a medical check-up prior to the study to confirm their health status and readiness to participate in the 6-week recreational activities program. All participants willing agreed to take part in this study.

2.2 Recreational activities program

The 6-week recreational activities program was designed based on the contents of Thai local recreation activities, physical activities and exercise methods suitable for older people. The program was then reviewed by 5 experts in the field of physical activity and exercise for older people to validate the suitability of its contents and structure. The 6-week recreational activities program earned a score of 0.5 for validity which indicates the suitability of the program. A pilot testing of the program was conducted with a non-target group to assess the program's reliability, resulting in a Cronbach's Alpha Coefficient of .92.

The program implemented over 6 weeks period, consisting of 3 days per week each lasting 60 min. The program consisted of the sessions of warm-up activities, stretching activities, exercise activities and cool-down activities by using various types of exercise equipment and workouts that include 1) Krabi Krabong activity is the national martial arts sport and exercise of Thailand. The main purpose of this exercise is to improve co-ordination muscle strength and muscle endurance. 2) Elastic band exercise is resistance exercise by using elastic band as equipment to develop muscle strength. 3) 9-Square movement exercise is balance improving exercise that involves moving your feet around a 9-square grid. 4) Paslop dance is traditional dance from Laos that include sets of walking and twisting movements with music to improve co-ordination and maintain balance. 5) Folk games are various types of Thai traditional games that can help to improve physical fitness and to build relationships of all ages. 6) Tie-dye fabric activities is a pattern made on the fabric using the technique of creating patterns on fabric through various techniques such as binding, compressing, or folding techniques, allowing for endless possibilities and personal expression.

2.3 Physical fitness test

The Department of Physical Education [3] stipulates five criteria for physical fitness for elderly people ages range from 60 to 69 years including body composition, flexibility, muscular strength, muscular endurance, and cardiovascular endurance. These can be tested by the health-related physical fitness of people age between 60-69 years old protocols [3]. The testing protocols consist of 5 tests including body mass index test (BMI), back scratch test, 30 seconds chair stand test, 2 min step up and down test, and agility course test.

2.4 Procedure

After the 6-week recreational activities program had been designed and validated. Additionally, the participants had been recruited and were ready to participate in this study the participants were assigned to test the 5 criteria of health-related physical fitness testing protocols of The Department of Physical Education [3]. These included 1) body mass index test (BMI) test to assess body composition in terms of body proportionality between weight and height, measured in 'kg/m²', 2) back scratch test (right and left arm) to assess shoulder flexibility, measured in 'centimeters (cm)', 3) agility course test to assess agility and dynamic balance measured in 'seconds (sec)', 4) 30 seconds chair stand test to assess leg muscle strength and endurance measured in 'repetitions (reps)' within 30 seconds, and 5) 2 min step up and down test to assess cardiovascular endurance measured in 'repetitions (reps)' within 2 min. Prior to engaging in the program, the participants were assigned to engage in the program for 60 min per day, 3 days per week (Monday, Wednesday, and Friday) over period of 6 weeks. After completing the 6-weeks program, the participants were assigned to re-test the physical fitness testing protocols. Data on health-related physical fitness test scores, both before and after the program, were collected, analyzed and resulted.

2.5 Statistical analyses

Descriptive statistics were used to analyze the health-related physical fitness test scores of the samples including the mean and standard deviation. A paired-sample *t*-test was used to determine the mean difference of the health-related physical fitness test scores of the samples before and after program. The level of statistical significance was set at 0.05.

3. Results

From Table 1 above, a comparison of 20 participants of 60-69 years old group's physical fitness scores between pre- and post-program showed statistically significant improvements in all five tests: back scratch test both arms (right arm: pre-mean = 28.00 cm, post-mean = 25.65 cm; left arm: pre-mean = 29.55 cm, post-mean = 27.45 cm), agility course (pre-mean = 20.38 sec, post-mean = 17.56 sec), 30-seconds chair stand (pre-mean = 14.60 reps, post-mean = 17.95 reps), and 2-min step up and down (pre-mean = 89.15 reps, post-mean = 101.30 reps). However, there was no statistically significant improvement in the BMI test.

Table 1 A comparison of 20 participants of 60-69 years old group's physical fitness before and after participating in the 6-week recreational activities program.

Items	Pre (Before)		Post (After)		t	p
	Mean	SD	Mean	SD		
Body mass index (kg/m ²)	20.40	3.73	20.25	2.86	.54	.591
Back scratch right arm (cm)	28.00	2.67	25.65	3.09	7.57	.000*
Back scratch left arm (cm)	29.55	2.41	27.45	3.21	6.04	.000*
Agility course (sec)	20.38	4.05	17.56	3.38	5.18	.000*
30-seconds chair stand (reps)	14.60	2.79	17.95	3.53	-5.43	.000*
2-min step up and down (reps)	89.15	4.48	101.30	6.94	-9.79	.000*

Note: Standard criteria for assessing five components of health-related physical fitness among elderly people aged 60-64 years group established by the Department of Physical Education [3]. BMI test mean: 15.82 – 21.23 kg/m² = 'underweight', 21.24 – 26.29 kg/m² = 'normal', 26.30 – 30.48 kg/m² = 'overweight'. Back scratch (right and left) test mean: 17.00 – 22.99 cm = 'normal', 23.00 – 28.50 = 'low', Agility course test mean: 13.40 – 17.33 sec = 'good', 17.34 – 21.25 sec = 'moderate', 21.26 – 25.15 sec = 'low'. 30-second chair stand test mean: 13.50 – 18.99 reps = 'low', 19.00 – 23.99 reps = 'moderate', 24.00 – 26.50 reps = 'good'. 2-min step up and down test mean: 61.50 – 83.49 = 'low', 83.50 – 104.99 = 'moderate', 105.00 – 126.99 = 'good'. **p* < .05.

From Table 2 above, a comparison of 10 participants of 60-64 years old group's physical fitness scores between pre- and post-program showed statistically significant improvements in all five tests: back scratch test both arms (right arm: pre-mean = 26.50 cm, post-mean = 23.60 cm; left arm: pre-mean = 27.02 cm, post-mean = 25.10 cm), agility course (pre-mean = 17.06 sec, post-mean = 15.40 sec), 30-seconds chair stand (pre-mean = 16.40 reps, post-mean = 21.00 reps), and 2-min step up and down (pre-mean = 91.60 reps, post-mean = 107.30 reps) However, there was no statistically significant improvement in the BMI test.

Table 2 A comparison of 10 participants of 60-64 years old group's physical fitness before and after participating in the 6-week recreational activities program.

Items	Pre (Before)			Post (After)			t	p
	Mean	SD	Levels	Mean	SD	Levels		
Body mass index (kg/m ²)	22.00	4.32	Normal	21.50	3.43	Normal	1.46	.177
Back scratch right arm (cm)	26.50	2.79	Low	23.60	3.09	Low	5.74	.000*
Back scratch left arm (cm)	27.02	4.35	Low	25.10	2.84	Low	7.61	.000*
Agility course (sec)	17.06	0.99	Normal	15.40	1.06	Good	3.98	.003*
30-seconds chair stand (reps)	16.40	2.67	Low	21.00	1.76	Normal	-4.81	.001*
2-min step up and down (reps)	91.60	3.86	Normal	107.30	3.86	Normal	-11.77	.000*

Note: Standard criteria for assessing five components of health-related physical fitness among elderly people aged 60-64 years group established by the Department of Physical Education [3]. BMI test mean: 15.82 – 21.10 kg/m² = 'underweight', 21.11 – 25.90 kg/m² = 'normal', 25.91 – 30.57 kg/m² = 'overweight'. Back scratch (right and left) test mean: 16.00 – 22.99 cm = 'normal', 23.00 – 29.99 = 'low', more than 30.00 cm = 'very low'. Agility course test mean: 12.20 – 16.22 sec = 'good', 16.23 – 20.25 sec = 'moderate', 20.26 – 24.28 sec = 'low'. 30-second chair stand test mean: 16.20 – 20.99 reps = 'low', 21.00 – 25.99 reps = 'moderate', 26.00 – 28.99 reps = 'good'. 2-min step up and down test mean: 65.00 – 86.99 = 'low', 87.00 – 107.99 = 'moderate', 108.00 – 129.99 = 'good'. *p < .05.

From Table 3 above, a comparison of 10 participants of 65-69 years old group's physical fitness scores between pre- and post-program showed statistically significant improvements in all five tests: back scratch test both arms (right arm: pre-mean = 29.50 cm, post-mean = 27.70 cm; left arm: pre-mean = 30.40 cm, post-mean = 29.80 cm), agility course (pre-mean = 23.70 sec, post-mean = 19.72 sec), 30-seconds chair stand (pre-mean = 12.80 reps, post-mean = 14.90 reps), and 2-min step up and down (pre-mean = 86.70 reps, post-mean = 95.30 reps) However, there was no statistically significant improvement in the BMI test.

Table 3 A comparison of 10 participants of 65-69 years old group's physical fitness before and after participating in the 6-week recreational activities program.

Items	Pre (Before)			Post (After)			t	p
	Mean	SD	Levels	Mean	SD	Levels		
Body mass index (kg/m ²)	18.80	2.25	Underweight	19.00	1.41	Underweight	-0.48	.642
Back scratch right arm (cm)	29.50	1.50	Low	27.70	1.16	Low	6.19	.000*
Back scratch left arm (cm)	30.40	1.19	Low	29.80	1.23	Low	3.16	.012*
Agility course (sec)	23.70	3.03	Low	19.72	3.56	Normal	4.53	.001*
30-seconds chair stand (reps)	12.80	1.47	Low	14.90	1.59	Low	-3.58	.006*
2-min step up and down (reps)	86.70	3.70	Normal	95.30	2.63	Normal	-6.21	.000*

Note: Standard criteria for assessing five components of health-related physical fitness among elderly people aged 65-69 years group established by the Department of Physical Education [3]. BMI test mean: 15.82 – 21.37 kg/m² = 'underweight', 21.38 – 26.68 kg/m² = 'normal', 26.69 – 30.40 kg/m² = 'overweight'. Back scratch (right and left) test mean: 18.00 – 23.99 cm = 'normal', 24.00 – 30.99 = 'low', more than 31.00 cm = 'very low'. Agility course test mean: 14.61 – 18.45 sec = 'good', 18.46 – 22.25 sec = 'moderate', 22.26 – 26.30 sec = 'low'. 30-second chair stand test mean: 13.00 – 16.99 reps = 'low', 17.00 – 21.99 reps = 'moderate', 22.00 – 25.99 reps = 'good'. 2-min step up and down test mean: 58.00 – 79.99 = 'low', 80.00 – 101.99 = 'moderate', 102.00 – 123.99 = 'good'. *p < .05.

4. Discussions

The analysis of the participant's physical fitness before and after engaging in the program using the standard criteria revealed statistically significant differences. Physical fitness in all aspects showed improvement, except for the body mass index, which showed no significant change among the elderly people. The results showed that recreational activities programs such as Krabi Krabong, Elastic Band Exercise, and Paslop dance can enhance muscular strength and endurance. Additionally, the 9-Square movement exercise, Paslop dance, and Folk games help improve agility. All participants showed satisfaction and enjoyment with the recreational activities, particularly Tie-dye fabric activities. Elderly people are changing in a degenerative direction, which inevitably leads to health problems, particularly chronic non-communicable diseases, and often results in inability to carry out daily activities on their own. As noted by Skatacka K., and Btonska K. [5] both the frequency and the intensity of physical activities improve life satisfaction. Older adults with low activity levels rarely choose cognitive or physically demanding activities over those that are less demanding. In contrast, more active older adults prefer frequent but light physical activity, social interactions and solitary entertainment. The results were synchronized with the standards set by the World Health Organization [19], the U.S. Department of Health and Human Services [17], and the U.S. National Institute on Aging [18]. It is recommended that elderly regularly do physical activities suitable for their age as part of their daily life because they will help improve cognitive ability, including perception and memory. Furthermore, doing physical activities regularly reduces levels of anxiety and depression improve physical fitness and strengthens bones, joints, muscles, and respiratory as well as cardiovascular systems. The elderly should perform physical activities at least three to five days a week, or 150 to 300 min a week, with activities that focus on strengthening their muscles at least two days a week [2,12,19], [14,17,18]. These benefits supported by a study conducted by Perula et al. [10], which examined the effectiveness of an exercise program in preventing falls among elderly people. The study revealed that after 12 months of the experiment, the fall rate among the participants had decreased. Similarly, Singh, B. [14] emphasized that recreation plays a key role in the well-being of older adults and in enhancing their quality of life. For seniors, as for people of all ages, involvement in recreation activities can fulfill a variety of needs. Among the important benefits of recreation for the senior population are improving health and fitness, as along with opportunities for socializing, for using skills and talents developed over a lifetime, and for learning new skills. Moreover, after completing the program, participants continued to spend their free time after studying doing more exercise with resistance bands in order to enhance their physical fitness, restore their muscles, tendons, and joints, and regenerate and strengthen bone mass to prevent bone cancer. The U.S. Department of Health and Human Services [17] recommends aerobic exercise for the elderly because this type of exercise requires continuous movement of core muscles. Activities that focus on strengthening bones and muscles help reduce the risk of losing muscle strength and endurance, while activities that focus on flexing muscles help improve the range of motion, thereby reducing the risk of falls and other injuries.

However, all healthy elderly people should participate in moderate intensity aerobic physical activity for a minimum of 30 min on five days per week, or vigorous intensity aerobic activity for a minimum of 20 min on three days per week. In addition, every adult should perform activities that maintain or increase muscular strength and endurance for a minimum of two days per week [2,12,17]. For older adults, regular exercise is one of the best way to live a long and healthy life. There are many health and lifestyle benefits of physical activity for senior citizens. People with an active lifestyle tend to feel healthier and have an improved sense of well-being. This is because regular exercise help reduces the risk of diabetes, heart disease, colon cancer and stroke.

5. Conclusions

The 6-week recreational activities program has been shown to improve health-related physical fitness in the elderly people, including flexibility, muscle strength, muscle endurance, and cardiovascular endurance. However, the 6-week recreational activities program did not result in a statistically significant improvement in body mass index, indicating that this aspect requires further investigation in future studies. To maintain overall physical fitness, all healthy elderly people should participate in regular physical activities or creational activities, including exercises that to promote cardiovascular endurance, muscle strength, muscle endurance, and flexibility, which are essential for their health and well-being.

6. Ethical approval

This study was approved by the University of Phayao Research Ethics Committee for Research Involving Human Subjects. The approval was granted under registered registration number of this research is 1.3/039/64, authorized on September 19, 2021.

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