

# Factors Related to Physical Activity Among the Elderly Population in Rural Thailand

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## Abstract

Physical activity in later years of life is not only essential to healthy aging and independent functioning, but it also helps prevent chronic diseases. We aimed this cross-sectional study to assess the prevalence of physical activity and associated factors among rural elderly Thais. We conducted this study on a sample of 300 elderly in 2 rural districts of Phranakornsiayutthaya province in Thailand. The mean age of participants were 67.5±6 years and 42% of them did not perform physical activity. Prevalence of vigorous and moderate intensity physical activity was 43.7% and 48.7%, respectively. About 43.7% elderly used any active transport and spent 2.81 hours on sedentary activities, daily. Females and those with enough income were 3.64 and 0.59 times, respectively, less likely to be physically active ( $P < .05$ ). Our study concluded that almost half of the rural Thai elderly were physically inactive. Also male and wealthy elderly were less likely to be engaged in physical activity. We recommend for improved efforts to involve rural Thai elderly in physical activity by offering them opportunities for locally relevant recreational and leisure time physical activities, with special focus on males and higher income elderly.

## Keywords

elderly, rural Thailand, physical activity, leisure time, routine

## Introduction

Thailand has one of the rapidly increasing elderly population, and country's aged population has increased from 6.8% in 1994 to 9.4% and 12.2% in 2002 and 2012, respectively.<sup>1</sup> A large proportion of elderly population has created significant challenges for the country's health care system as more than 50% elderly in Thailand currently suffer from at least 1 chronic disease.<sup>2</sup>

Age-related frailty and loss of function can lead to a number of challenges such as difficulty in walking long distances and climbing stairs or carrying objects. Lack of physical activity (PA) in the elderly is a known risk factor for many chronic illnesses. PA can delay and reduce the risk and mortality from noncommunicable diseases (NCDs).<sup>3,4</sup> PA is also essential for improving quality of life in the elderly; therefore, regular PA improves physical and psychological health in the elderly. PA is affected in elderly because of diverse factors including age, gender, marital status, level of education, income, and living with health problems.<sup>5</sup>

The elderly are recommended to spend 150 minutes on moderate-intensity exercises and activities in a week.<sup>6</sup> These activities refer to the bodily movements produced by

skeletal muscles including activities at work, travel to and from different places and recreational activities. PA helps in improving muscle strength, power and functional performance in elderly, and this positive gain in muscle strength in lower body is linked with improved abilities to carry out routine daily tasks.<sup>7</sup> Mostly, aging population is aware that the regular PA prevents chronic illness and keeps them healthy, but they are not regularly adopting this life style. Younger age, a lower body mass index (BMI), and better health status, have all been shown to be positively associated to PA in the elderly.<sup>8</sup>

Phranakornsiayutthaya Province, in central region of Thailand, has experienced increase in the proportion of

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elderly in their population, from 12.3% in 1990 to 13.7% in 2011. Such a fast rate of aging in 2011 ranked the province the second highest with regard to proportion of elderly population in central Thailand. A survey conducted by the National Health Examination office in 2010 showed that 21.2% of population in central region of Thailand was physically inactive, which ranked this region at third with regard to people living with physical inactivity. In this province, 81% of the elderly did less than 30 minutes of routine PA.<sup>9</sup> This study aimed to determine the prevalence of and factors related to PA among the elderly in the rural areas of Phranakornsiyutthaya province of Thailand.

## Methods

We conducted this cross-sectional study in Ban Mai and Wat Tum subdistricts of Phranakornsiyutthaya district. A sample of 300 elderly, 150 each from Ban Mai and Wat Tum subdistricts, was selected because it had the second highest elderly population ratio of 14% in central Thailand. Elderly males and females of 60 years and older were eligible, and those who could read easily to be included in the study purposively. The tool was piloted in similar population in the adjacent district of Thailand before data collection process.

Data were collected through face-to-face interviews by a trained interviewer through adapted global PA questionnaire version 2. The questionnaire consisted of 4 domains and 16 items. The domains included activities at work (6 items); travel to and from various places (3 items), recreational activities (6 items), and sedentary behaviors (1 item). Total time spent on PA was categorized according to the national recommendation that elderly should perform a minimum of 150 minutes of moderate-intensity PA per week. Pilot study was done with 30 elderly at Ban Pom subdistrict in the same district. The content validity of the questionnaire was assessed through index of item objective congruence (IOC = 0.5-1.0) method, which was later assessed by a panel of experts who were specialists in PA and geriatrics. The reliability score was calculated through Cronbach's alpha, which was statistically significant (coefficient 0.7). Ethical approval for the study was obtained from the research data protection inspectorate and the College of Public Health Sciences, Chulalongkorn University and informed and written consent was obtained from all participants.

## Results

Data were analyzed through the Statistical Package for the Social Sciences for Windows, Version 18. The mean age of the participants in our study was 67.4±6.6 years and most were in the 60- to 69-year age range, 50.7% were females and 74.7% were married. About half of the elderly said that they had enough or extra income. The majority (93.7%) had completed primary school. Though 64.7% had normal BMI

**Table 1.** Prevalence of Physical Activity in the Elderly in Phranakornsiyutthaya, Thailand.

	n	%
Physical activity		
No	124	41.3
Yes	176	58.7
Work-related physical activity		
Vigorous-intensity activities		
No	169	56.3
Yes	131	43.7
Moderate-intensity activities		
No	154	51.3
Yes	146	48.7
Travel-related PA		
No	169	56.3
Yes	131	43.7
Recreational or leisure time physical activity		
Vigorous-intensity activities		
No	188	62.7
Yes	112	37.3
Moderate-intensity activities		
No	260	86.7
Yes	40	13.3
Sedentary behavior, hours/day		
<3	131	43.7
3-4	133	44.3
>4	36	12.0
Total time of physical activities, minutes/week		
<150	152	50.7
>150	148	49.3

and their mean BMI was 23.6±3.6 kg/m<sup>2</sup>, 25.3% were overweight and 5%, each, were obese and thin. More than half of participants (56.0%) had a senior citizen club membership. We found that 61% of elderly knew that they had any chronic illness. Most of them (79.7%) never smoked tobacco, 12.3% ever smoked but quit sometime in the past, and 8% smoked at the time of the study. Also, 77% of the participants never drank alcohol, 13% had ever drunk but quit, but 10% still drank at the time of the study.

We found that 58.7% of the elderly performed any PA. Work-related vigorous (heavy loads, farming) and moderate-intensity PA (brisk walking, housework) was performed by 43.7% and 48.7% of the elderly, respectively. Travel-related PA such as walking and biking was performed by 43.7%. Recreational or leisure time vigorous intensity PA such as jogging and aerobics exercise and moderate-intensity activities such as swimming and cycling were performed by 37.3% and 13.3% of the elderly, respectively. A proportion of 44.3% of elderly in our study had sedentary behavior as they spent 3 to 4 hours per day (mean 2.81±1.5 hours) sitting at work, at home, and while they were with their friends. About half of our participants (49.3%) performed PA according to the national guidelines (Table 1).

**Table 2.** Bivariate Analysis of the Factors Related With Physical Activity in the Elderly in Phranakornsiyutthaya, Thailand.

	Physically Active, n (%)	Physically Inactive, n (%)	P
Sex			<.001
Male	62 (41.9)	86 (58.1)	
Female	114 (75.0)	38 (25.0)	
Age, years			.343
60-69	126 (56.2)	98 (43.8)	
70-79	36 (65.5)	19 (34.5)	
≥80	14 (66.7)	7 (33.3)	
Marital status			.046
Single/divorced/separated	52 (68.4)	24 (31.6)	
Married	124 (55.4)	100 (44.6)	
Education level			.173
No education/primary school	164 (57.7)	120 (42.3)	
High school	12 (75.0)	4 (25.0)	
Income			.007
Not enough	90 (67.2)	44 (32.8)	
Enough	86 (51.8)	80 (48.2)	
Body mass index, kg/m <sup>2</sup>			.548
Low/thin (<18.5)	8 (53.3)	7 (46.7)	
Normal (18.5-24.9)	109 (56.2)	85 (43.8)	
Overweight (25.0-29.9)	49 (64.5)	27 (35.5)	
Obese (>30)	10 (66.7)	5 (33.3)	
Senior citizen club member			.713
Yes	97 (57.7)	71 (42.3)	
No	79 (59.8)	53 (40.2)	
Health problems			.006
Yes	96 (52.5)	87 (47.5)	
No	80 (68.4)	37 (31.6)	
Smoking			.001
Current smoker	11 (45.8)	13 (54.2)	
Yes, but quit	12 (32.4)	25 (67.6)	
No	153 (64.0)	86 (36.0)	
Alcohol drinking			.002
Drinks currently	13 (43.3)	17 (56.7)	
Yes, but quit	15 (38.5)	24 (61.5)	
No	148 (64.1)	83 (35.9)	

We measured the statistical significance of various factors with PA using the chi-square test and we found that gender ( $P < .001$ ), smoking ( $P = .001$ ), marital status ( $P = .046$ ), alcohol drinking, ( $P = .002$ ), income ( $P = .007$ ), and health problems ( $P = .006$ ) as the most statistically significant in our sample (Table 2).

Enter method of binary logistic regression was used to measure the associations of independent variables, including sex, age, marital status, education, income, BMI, senior citizen club membership, health problems, smoking, and alcohol drinking, with the dependent variable, which was PA versus no PA. Associations are presented as odds ratios (ORs) with 95% confidence intervals (CIs). Differences in results were considered statistically significant at 5% level of significance ( $P < .05$ ). We found that all 6 independent variables were statistically significant in the bivariate analysis. Next we used

multiple logistic regression to analyze the independent relationships and to account for the confounding effect of the sex, marital status, income, health problems, tobacco smoking, and alcohol drinking. We found that females were about 3 times more likely to be physically active as compared with males ( $P < .001$ ). However, weight, marital status, smoking, and alcohol drinking were statistically insignificant. Income and health problems were also not statistically significant but the  $P$  values were not very large ( $P < .15$ ), therefore we included them in our second or final multiple logistic regression model. We found that the females were 3.64 times more likely to do PA and the association was intensified in the final model. The elderly who said that they had enough income were 0.59 times less likely to be physically active as compared with those with not enough income. Our findings also suggest that association for health problems with PA were

**Table 3.** Factors Associated With Physical Activity in the Elderly.

	B	Crude Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)	P <sup>a</sup>
Gender				<.001
Male		1 (ref)	1	
Female	1.09	4.16 (2.54-6.80)	2.98 (1.70-5.23)	
Marital status				.173
Unmarried		1	1	
Married	-0.42	0.57(0.32-0.99)	0.66 (0.36-1.20)	
Income				.059
Not enough income		1	1	
Enough income	-0.50	0.52 (0.32-0.84)	0.61 (0.37-1.02)	
Health problems				.081
No		1	1	
Have health problems	-0.48	0.51 (0.31-0.82)	0.62 (0.36-1.06)	
Smoking				.997
No smoking		1	1	
Quit	-0.37	0.26 (0.12-0.56)	0.69 (0.26-1.84)	
Current smoker	-0.02	0.47 (0.20-1.10)	0.99 (0.34-2.90)	
Alcohol drinking				.472
No drinking		1	1	
Quit	-0.223	0.35 (0.17-0.70)	0.80 (0.31-2.07)	
Drinks currently	-0.358	0.42 (0.19-0.92)	0.70 (0.26-1.86)	

<sup>a</sup>For multiple logistic regressions, constant = 0.837.

marginally significant and those with health problems were 0.39 times less likely to do any PA as compared with normal elderly (Table 3).

## Discussion

We assessed the prevalence of PA and determined the factors associated with it in this study in a sample of elderly population from rural Thailand. We found that 41% of the elderly did not perform any PA and detailed interviews found even lower levels of vigorous- and moderate-intensity exercises among them, with more than half not practicing such exercises. However, we found statistically significant relationship between PA and female gender, younger, married, not wealthy, diseased, nonsmokers, and non-alcohol drinking elderly; our multivariate analysis showed a significant association of PA with females and elderly who said they did not have enough income.

PA declines proportionately with age among the elderly.<sup>10</sup> A large number of elderly, if not most in our sample, did not perform any PA. As the elderly in our study performed moderate-intensity more than vigorous-intensity PA this explains the effects of frailty, which is a consequence of aging process.<sup>11</sup> Our results are consistent with other studies; such as one from Poland, which showed that 42% Polish elderly did not perform recommended levels of PA; though the PA was measure differently from our study.<sup>12</sup> Global or overall prevalence of PA has been shown to be higher as compared with leisure time in other countries and our results concur with

such a pattern. Only less than a quarter of Brazilian and Chinese elderly were engaged in leisure time PA.<sup>13,14</sup> Most of the elderly in our sample performed moderate-intensity activities such as walking, riding a bike, and doing housework. Evidence suggests that elderly carrying out their routine activities such as housekeeping are more active and healthier than those who are sedentary.<sup>15</sup> This is because physically active elderly can delay frailty and can continue their functions for much longer than their inactive counterparts.<sup>16</sup>

Our findings that Thai female elderly were 3.64 times more physically active than their male counterparts, are different than studies from other settings where the association of lack of PA is shown to be homogenous across gender.<sup>17,18</sup> In Thai families, mostly, men are the heads or leaders of the households and when they get older, their roles may change, which could be the reason for their being less active than their female counterparts. In Thai culture, females perform household chores such as cooking, cleaning, sweeping, and they also contribute to gardening more than males. Other explanation for elderly women to be more active than men could be that rural women are mostly associated with agriculture and farming. In other settings, such as in England, where the elderly enjoy relative freedom of movement without any gender-related restrictions there is not much gender difference in engagement in active lifestyle.<sup>19</sup>

We also found that income had an inverse relationship with PA. A Swiss study showed that wealthier elderly were more likely to be physically active; however, such an association was not causally conclusive.<sup>20</sup> Elderly with sound

income are less likely to work but those who need to work to earn money in order to support families may work in the rice farm or are associated with crop production or other jobs requiring moderate-intensity PA. Also in rural areas wealthier families tend to be more restful and engage in sedentary behaviors; for instance, they spend more time watching TV. Wealthier elderly also travel more by motorized vehicles and avail less opportunities to commute by active means such as walking and cycling.

In conclusion, a high prevalence of physical inactivity was found in our sample of Thai elderly. Females were about 3.5 times more likely to be physically active than males. However, income had an opposite association with PA as elderly with enough wealth were about 40% less likely to be physically active. There is need of promoting healthy behaviors and encourage PA among male elderly and higher income population in rural areas of Thailand to be more physically active.

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