ACTIVE AGEING LEVEL IN THAILAND: A COMPARISON BETWEEN FEMALE AND MALE ELDERLY

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ABSTRACT:

Background: Active ageing is a global goal in today's ageing world for meeting the challenges of elderly and for improving their quality of life. Determinant factors of active ageing and their indicators need to be better understood for developing policies and programs focused on active ageing in an ageing society. Thailand has become an ageing society and is going to increase her elderly population but determinant factors and level of active ageing are not known clearly.

Methods: Using exploratory factor analysis on data from the 2011 Survey of Older Persons in Thailand (n=23,801 elderly), attempts have been made to find the determinant factors of active ageing level. Similarity of factor structure (relationships of indicator variables with determinant factors) of active ageing for female and male elderly has been tested. Also, attempt has been made to find the directions of relationships of active ageing level with important indicators (determinant factors).

Results: Results revealed different factor structure of active ageing for female and male elderly. This study found six determinant factors of active ageing for each gender of elderly in the broader cultural context of Thailand. Based on the determinant factors (their scores, and index value), active ageing index (AAI- ranges from 0 to 1) has been estimated. The mean active ageing level for female and male elderly found as 0.66 and 0.62, respectively.

Conclusion: Active ageing level of elderly yet to be improved in Thailand as active ageing level in Thailand is not high (evidenced as far behind the goal). For increasing active ageing level of elderly in Thailand policy should be focused for elderly to fulfill health needs, to promote longer working lives, toarrange lifelong a learning program, and to improve financial/economic conditions.

Keywords: Active ageing, Elderly, Health status, Thailand

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INTRODUCTION

Population ageing has been identified as a global phenomenon and one of the faster growing demographic trends driven by the reduction of fertility and mortality [1]. The growth of population ageing in Thailand is faster compare to other Asian countries [2]. The pace of recent population ageing in Thailand is faster than other Asian countries and even far faster than developed countries in the West [2, 3] and proportion of elderly (aged 60 and over) is projected to approach more than 30% within next three decades in Thailand [4]. This demographic phenomenon has comprehensive consequences for individuals, families, communities and society as a whole [3]. Since elderly are regarded as dependent hence they are likely to be burden of family, community, society and of the nation as a whole [5]. For enabling elderly of having longest possible period of active and healthy old age (not a burden), it is necessary to invest in such a way that increase in life expectancy may be accompanied with improved conditions in life.

The older paradigm of ageing, as 'dependent stage of life', has been shifted to a new paradigm which emphasizes 'active ageing" for the contexts of twenty-first century's ageing world [6]. Also, other concepts such as healthy ageing, successful

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ageing, ageing well are shifting to the more comprehensive concept as of 'active ageing' and this is the global goal of research and policy of ageing [7]. The 'active ageing' topic has been circulated worldwide as one of the major approaches to meeting the challenges of ageing population [8] and active ageing has been approved as the major objective of health and social policies for elderly [9]. Though Thailand's Second National Plan for Older Persons (2002-2021) has been adopted and is presently operating but is not fully covering all aspects of active ageing approach [10].

Active ageing can be explained as a concept [11] and Walker has defined it as profound strategy to maximize participation and wellbeing as people grow older [11]. World Health Organization (WHO) defined active ageing as the way of thinking and working on "the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age" [9]. The concept of active ageing can be encapsulated as 'engaged in life' and this concept influenced by several groups of determinants or determinant factors [9]. Factors of active ageing and their measures (of determinant factors) need to be better understood for developing policies and programs focused on active aging in Thailand [12]. Meanwhile, level of active ageing of elderly in Thailand is still not known accurately or little has been known. There were no studies for estimating active ageing level using individual level data on predictors of active ageing construct. There were no study on explaining determinant factors of active ageing and their indicators using reflective model in Thailand. Fortunately, WHO formulated a theoretical model of active ageing containing the six (unobserved) determinant factors along with culture and gender as cross-cutting determinants. This implies that those unobserved determinant factors of active ageing may vary depending on the context of gender and culture per se of the studied subjects [9] as was partially evidenced by a study of Paul et al. in Portugal [13]. No such study has been conducted for active ageing in Thailand. Hence, there is a scarce of studies, so far in knowledge, for identifying significant determinant factors of active ageing and for estimating the active ageing level properly in the broader cultural context of Thailand.

The objectives of this study was **t**o gain empirical knowledge on the sphere of active ageing of elderly in Thailand, the main objectives of this study are to:

(i) find the determinant factors of active ageing

(ii) test the similarity of factor structure of active ageing for female and male elderly

(iii) estimate the active ageing level of elderly

(iv) test the relationship of indicators (of active ageing determinants) with active ageing level

METHODOLOGY

Data

Data for this study come from the 2011 Survey of Older Persons in Thailand (SOPT). The SOPT was conducted by Thailand's National Statistical Office (NSO). The sample of SOPT consists of 62840 persons aged 50 years and over and 54% of whom were 60 years and older. The data have been collected in SOPT by using stratified two-stages sampling method (data have been collected from all regions –Central, North, Northeast and South; and from all provinces — two stages stratified sampling technique has been applied in each province). The primary sampling units, in every province, were villages for non-municipal areas and blocks for municipal areas. The secondary sampling units were private dwellings/households selected by random sampling from the list of all enumerated households in each village or block of the first sampling units. The 2011 SOPT is a nationally representative survey which covers data for population sub-groups or geographic sub-areas (e.g. regions and urban-rural areas). Further details of the methodology, including sampling strategy, for SOPT is available at NSO's 'report on the 2011 Survey of Older Persons in Thailand' [14]. This study included individuals aged 60 years and over (n=23,801; Female=14,369and Male=9,432).

Methods

For fulfilling specified objectives, this study aims to accomplish exploratory factor analysis (EFA) which enables to find the factor structure (relationships of indicator variables with determinant factors) of active ageing. Application of EFA for common factor model (active ageing model in this study, a common factor is an unobserved variable which affect more than one measured variables) is useful to understand the unobserved variables (determinant factors in this study) that account for indicator variables (measured variables). EFA enables to identify the sets or clusters of indicators (i.e. factors) by producing correlation matrix among the indicator variables. Therefore, for finding the unobserved determinant factors of active ageing some indicator variables should be needed to use in EFA and EFA will make significantly correlated indicator variables to be clustered into a smaller

Table 1 Determinant factors (theoretical) of active ageing and their important aspects

Determinant factors	Aspects/Variables
Personal	Biology and genetics, psychological factors
Behavioral	Smoking, physical activity, food intake, oral health, alcohol, medication
Health and social services	Health promotion and disease prevention, curative health services, continuous care, mental health care
Social environment	Social support, violence and abuse, education
Economic	Income, social security, work
Physical environment	Friendly environment, safety houses, falls, absence of pollution
Gender and culture (Cross cutting determinants)	

Source: World Health Organization [9]

Table 2 Selected measured variables (indicators) for finding factor structure of active ageing in Thailand

Variables	Coding
Age	1=60-69 years; 2=70-79 years; 3=80+ years
Marital status	1=single; 2=married 3= widow/divorced/separated
Happiness level[a]	1=1-6; 2=7-8; 3=9; 4=10
Psychological distress status	1=very high; 2=high; 3=moderate; 4=poor or nearly never
Smoking	0=yes; 1=no
Drinking alcohol	0=yes; 1=no
Exercise	0=no; 1=yes
Basic ADL (activities of daily living) index	0=severe; 1=moderately severe;2=moderate; 3= independent
Subjective health	0=poor; 1=moderate; 2=good
Illness	0= two and/ more chronic illnesses; 1=one chronic illness; 2=none
Visibility	0=no or not clear; 1=clear
Hearing	0=no or not clear; 1=clear
Annual health check up	0=no; 1=yes
Education	0= no or less than primary; 1= primary; 2= secondary and/or higher
Social support quality	0= not satisfied; 1= satisfied
Community participation	0=no; 1=yes
Participate in elderly group	0=no; 1=yes
Work	0=no; 1=yes
Income[a]	1=no or <20000 Baht; 2=[20000, 40000[Baht; 3=[40000, 60000[Baht; 4=60000+ Baht
Sufficiency of income	0=not sufficient; 1=sufficient
Savings	0=no; 1=yes
Location of bed	0= ground floor; 1= upstair
Location of toilet	1= inside; 2= outside
Falls	0=yes; 1=no

[a]Quartiles

number of factors. These indicator variables have been selected based on the theoretical framework of WHO's active ageing model. Theoretical determinants factors of active ageing and their corresponding aspects/variables, developed by WHO, are provided in Table 1 and those variables are measurable [9].

Variables

Based on WHO's theoretical determinant factors and their associated indicator variables depicted in Table 1, this study preliminarily selected twenty four (24) related or proxy variables from SOPT data set to use in analyses (Only these 24 related or proxy variables are available in the 2011 SOPT data set). The selected variables from SOPT with their coding are provided in the Table 2. Meanwhile, this is the first aim, so far in knowledge, to use individual level data in the framework of WHO active ageing model for measuring active ageing level.

Factor structure analysis

To examine the factor structure of active ageing i.e.for determining and identifying the determinant factors of active ageing based on a set of indicator variables (Table 2), EFA technique was used. Using those selected indicator variables specified in Table 2, EFA has been run in SPSS version 16. EFA using principal axis factoring extraction method (i.e. factor analysis for common factor model)

Table 3 Factor structure of active ageing for female elderly in Thailand

Variables	Factor					
	1	2	3	4	5	6
Happiness	**.632**	-.086	.086	-.018	.020	-.023
Psychological distress status	**.540**	-.032	.063	.017	-.003	-.005
Subjective health status	**.495**	.167	-.026	-.001	.056	.022
Illness (chronic) status	**-.311**	-.241	.141	.012	.109	.000
Age	.086	**-.549**	-.015	-.002	-.177	.018
Basic ADL index	.173	**.516**	-.076	.018	.015	.033
Work status	-.023	**.509**	.096	-.016	-.084	-.011
Income	-.048	.252	**.600**	-.020	-.091	-.033
Sufficiency of income	.209	-.154	**.389**	.006	.007	-.011
Savings	-.013	-.064	**.385**	.004	.043	.098
Education	.009	.088	**.272**	.041	.119	-.013
Smoking	-.010	.034	.003	**.636**	-.008	.010
Alcohol drinking	.004	-.041	.008	**.614**	-.008	-.015
Visibility	.033	-.004	.059	-.002	**.550**	.009
Hearing	-.020	.018	-.026	-.014	**.589**	-.016
Community participation	.001	.094	-.018	.014	-.009	**.556**
Elderly group participation	-.015	-.087.	.084	-.018	-.004	**.537**
Eigen value (λ)	2.879	1.566	1.336	1.296	1.152	1.066
% of variance explained (54.68%)	16.933	9.214	7.860	7.624	6.779	6.272

KMO measure of sampling adequacy= .728, χ^2 significance= 0.001

with promax rotation was used. The WHO active ageing model indicated that determinants of active ageing are correlated with each other and promax rotation method allows the factors to be correlated with each other (a very likely situation). Factors which has eigenvalue (measures the extent to which a factor explains the variance) greater than one were utilized. For testing sampling adequecy and for testing significance of correlations among variables used for factor analysis, the Kaiser-Meyer-Olkin (KMO) statistic and Bertlett's sphericity test were performed, respectively.

Test for similarity of factors of active ageing for female and male elderly

Separate EFA for female and male elderly will enable to find factor structures for female and male elderly and hence the test of similarity of factor structure of active ageing for female and male elderly. Similarity of two factors obtained from separate factor analyses can be tested by a congruency index [15]. The congruency index for two factors of two groups as follows:

Congruency index for factor x of one group and factor y of other group,

$$CI_{xy} = \frac{\sum_1^n x_i y_i}{\sqrt{\sum_1^n x_i^2 \sum_i^n y_i^2}} \quad [15]$$

Where x_i and y_i are loadings (loading is expressed as the correlation between factor and indicator/measured variable) of variable i on factor x and factor y, respectively, i=1, 2, …, n.

Active ageing index calculation

From the achieved factor structure of active ageing of elderly, factor scores were obtained and hence values of factor indices for all elderly.

Factor specific indices were calculated by the following formula [16], for factors achieved from EFA:

$$\text{Index of } F_i,\ f_i = \frac{[\text{Score of } F_i - \text{Min}(\text{Score of } F_i)]}{[\text{Max}(\text{Score of } F_i) - \text{Min}(\text{Score of } F_i)]}$$

Where, F_i = i^{th} factor

Score of $F_i = \sum_{j=1}^{m} \ldots n$ Standardized value of indicator j of $F_i * W_{ji}$ I = 1, 2,…n [17], W_{ji} = weight for indicator j in factor i. Combining all factor indices, an active ageing index (AAI — Theoretical value of AAI ranges from 0 to 1) was calculated by using the following formula:

$$\text{AAI} = \frac{\sum_{i=1}^{k} f_i v_i}{\sum_{i=1}^{k} v_i};\ v_i = \frac{\lambda_i}{\sum_{i=1}^{k} \lambda_i} \text{ and } \sum_{i=1}^{k} \left(\frac{v_i}{\sum_{i=1}^{k} v_i} \right) = 1$$

Where, k= number of factors selected; f_i= index of F_i; v_i= the proportion of variance explained by F_i; λ_i= eigenvalue of F_i

An individual's value of AAI refers to his/her level in determinants of active ageing. An overall mean AAI was estimated from the values of AAI of all elderly.

Table 4 Factor structure of active ageing of male elderly in Thailand

Variables	Factor					
	1	2	3	4	5	6
Happiness	**.616**	-.065	.014	.122	-.049	-.008
Psychological distress status	**.509**	-.007	.060	.045	.003	-.025
Subjective health status	**.492**	.036	-.041	.008	.145	.010
Illness (chronic) status	**-.315**	-.111	.102	.215	.027	.018
Age	.119	**-.376**	.062	-.047	-.332	.056
Basic ADL index	.187	**.239**	-.066	-.049	.243	.009
Work status	.010	**.808**	.068	-.056	-.092	.039
Income	.000	**.323**	-.013	**.574**	-.083	-.038
Sufficiency of income	.235	-.074	.019	**.375**	-.093	.024
Savings	-.005	-.039	-.002	**.372**	-.003	.101
Education	-.044	-.179	-.035	**.433**	.249	-.053
Smoking	.001	.036	**.645**	.059	.087	.014
Alcohol drinking	.014	.035	**.721**	-.081	.011	-.029
Visibility	.066	-.056	.073	.033	**.510**	.029
Hearing	-.003	-.029	.048	-.009	**.567**	.028
Community participation	.008	.060	-.029	.001	.068	**.516**
Elderly group participation	-.040	-.014	.010	.076	-.007	**.564**
Eigen value (λ)	2.950	1.813	1.346	1.188	1.120	1.009
% of variance explained (55.44%)	17.351	10.664	7.918	6.985	6.588	5.935

KMO measure of sampling adequacy=.740, χ^2significance= 0.001

Relationship of active ageing level with indicator variables

To make results more understandable, relation of directly measured variables with active ageing level should be interpreted which may helpful for other researchers and policy makers. Using measured variables for each model, correlations between AAI and measured variables have been calculated.

RESULTS

A preliminary EFA for both genders, using 24 indicator variables listed in Table2, for screening variables, has been performed and seven variables (marital status, exercise, annual health checkup, social support quality, location of bed, location of toilet, falls) have been excluded for using in factor structure analysis because of low communalities (variance of a variable accounted for by all factors). Then again separate two EFAs has been re-run for female and male elderly (using remaining 17 indicator variables) and a six-factor factor structure has been identified for each gender which are provided in Table 3 and Table 4, respectively.

In the Table 3, the Bartlett's sphericity test revealed that data used are significant for factor analysis (at 0.001 level) and KMO statistic revealed a value of 0.728 both of which are indicating that data used in the EFA are suitable (i.e. EFA has been justified). Also, in the Table 4, the Bartlett's sphericity test revealed that data used are significant for factor analysis (at 0.001 level) and KMO statistic revealed a value of 0.740 both of which are indicating that data used in the EFA are suitable (i.e. EFA has been justified).

This study found six determinant factors of active ageing for both female and male elderly in Thailand. From the factor structure of female elderly appeared in Table 3, the successive factors could be labeled as 'Health status', 'Demo-physical condition', 'Socio-economic status','Risk behavior', 'Audio-visual capability' and 'Social participation', respectively.

From the factor structure of male elderly appeared in Table 4, the consecutive factors could be named as 'Health status', 'Demo-physical condition', 'Risk behavior','Socio-economic status', 'Audio-visual capability and 'Social participation, respectively.

Similarity of factor structure of active ageing of female and male elderly

Two factors' similarity could be tested by congruency index (CI) suggested by Lorenzo-Seva and ten Berge [15]. Congruency indices for factors for female elderly and for male elderly are provided in Table 5. Lorenzo-Seva and ten Berge suggested a fair similarity of two factors corresponds to a value of CI ranges from 0.85 to 0.94 and two factors should be considered similar when CI value exceeds 0.95 [15]. Comparing with the values of suggested congruency index (CI), 'Demo-physical condition' factors is showing different for female and male elderly but other factors are faily similar. So, it should be easily concluded that factor structures for female and male elderly are different.

Table 5 Congruency index (CI) for factors of active ageing for female and male elderly in Thailand

Factor for female→ / Factor for male↓	1	2	3	4	5	6
1	0.99					
2		0.83				
3*				0.97		
4*			0.96			
5					0.91	
6						0.99

Note: 1= Health status, 2= Demo-physical condition, 3, 4*= Socio-economic status, 3*, 4= Risk behavior, 5= Audio-visual capability, 6= Social Participation

Table 6 Correlation coefficients between measured variables and active ageing index (AAI)

Variable {variable's coding}	AAI	
	Female	Male
Happiness {1=1-6, 2=7-8, 3=9, 4=10}	.503**	.600**
Psychological distress status {1=very high; 2=high; 3=moderate, 4=poor}	.454**	.514**
Subjective health status {0=poor, 1=moderate, 2=good }	.555**	.610*
Illness (chronic) status {0= none, 1=one disease, 2= two +diseases }	-.226**	-.245**
Age {1=60-69, 2=70-79, 3=80+}	-.454**	-.376**
Basic ADL index {0=severe, 1=moderately severe, 2=moderate, 3= independent}	.481**	.479**
Work status {0=no, 1=yes}	.321**	.461**
Income {1=no or <20000 Baht, 2=[20000, 40000[Baht, 3=[40000, 60000[Baht, 4=60000+ Baht}	.452**	.525**
Sufficiency of income {0= not sufficient, 1= sufficient}	.331**	.373**
Savings {0=no; 1=yes}	.310**	.252**
Education {0= no or < primary, 1= primary, 2= secondary+}	.356**	.282**
Smoking {0=yes, 1=no}	.194**	.149**
Alcohol drinking {0=yes, 1=no}	.134**	.001
Visibility {0=no or not clear, 1=clear}	.515**	.418**
Hearing {0=no or not clear, 1=clear}	.441**	.379**
Community participation {0=no, 1=yes}	.399**	.280**
Elderly group participation {0=no, 1=yes}	.315**	.200**

Note: ** Correlation is significant at the 0.01 level

Comparing with the values of suggested congruency index (CI), 'Demo-physical condition' factor is showing different for female and male elderly but other factors are similar. So, it should be easily concluded that factor structures for female and male elderly are different.

Active ageing index for female and male elderly

As relationships of indicator variables with determinant factors of active ageing (factor structure of active ageing) are different for female and male elderly, separate active ageing index has been estimated for female and male elderly. The calculated mean AAI for female and male elderly are 0.66 and 0.62, respectively. Comparing these mean AAI with UNDP's Human Development Index (HDI), female and male elderly in Thailand had moderate level mean AAI [18].

Relationship of active ageing level with indicator variables

Correlation coefficients between measured variables and AAI for female and male elderly are provided in the following Table 6.

Correlation coefficients portrayed in Table 6 for female and male elderly revealed that illness status and age are negetively associated with AAI and other all measured variables are positively correlated with AAI.

DISCUSSION

Findings of this study, from the exploratory factor analyses, proved that active ageing factor structure varies depending on gender in Thailand. Using the nationally representative data from SOPT, this study found six determinant factors of active ageing for female and male elderly, similar results were found in a study by Paul et al. in Portugal [13]. Number of achieved determinant factors for female and male elderly is as same number as hypothesized in the World Health Organization's (WHO's) active ageing model. But they (determinant factors for female and male elderly) are departed from the

World Health Organization's active ageing model. The numerical values of AAI for both female and male elderly in Thailand must aim for further improvement. Because AAI shows that even for top performing female elderly still falls short by almost 34% to the highest desired status possible (i.e. the goalpost of AAI is equal to 1). For promoting active ageing, focus should be given to the identified determinant factors of active ageing. Determinant factors are latent, hence focused should be given to their corresponding indicator variables (i.e. measured variables) aiming to promote active ageing.

Subjective health status is related to how one person was facing illness or other health problems (including psychological distress), so for improving subjective health status aims should be taken to prevent or reduce illness (physical health problem) or treatment for illness. These will also affect the elderly to be independent in basic ADL and to increase their happiness level. Results indicated that less illness, low in vision and hearing impairment, less functional limitations (independent in ADL), less health risk behavior (e.g. no smoking) are influential to increase active ageing level of elderly. A substantial proportion of elderly have smoking behavior in Thailand. Results revealed that elderly people who smoke are lower in their active ageing level compare to elderly people who did not have smoking behavior. Smoking has effect on diminishing overall health, increasing health services utilization and cost and also on increasing absenteeism from work [19]; a similar type of relation of smoking to lowering active ageing of elderly in Thailand has been found in this study. Tobacco cessation counseling through health professionals such as nurses, community pharmachist may be effective way to increase the proportion of non-smoker in present and future cohort of elderly. This study found that elderly people who do not smoke are more likely to be higher in active ageing level. Along with other tobacco control programs, tobacco cessation counseling program will assist to increase the active ageing level of elderly and hence the elderly will gain good health, security, and would participate in the society.

For increasing active ageing level of elderly, along with the treatment for illness, their (elderly) health needs should be fulfilled through providing assistive devices (to whom it needed), measures should be taken for curative care for illness and continuous mental health care should be provided to elderly who has psychological problem. Government should provide assistive devices for elderly (who has functional limitations) — Easy access for assistive devices (e.g. walker/mover — for those who are in difficulties on walk or move, glasses — for those who have problem to see) should be ensured (it may provide directly to older persons who need) for older persons in order to help themselves in daily living activities, participate in social activites, and economic activities as well. Also, initiations should be taken for improving home environment as elderly friendly for those who have limations in activities in daily living. These may help elderly to maintain good health, daily living activities, participate in social activites, and economic activities as well.

Some one's age can act as a confounding variable affecting both some indicators of active ageing determinants and AAI. Elderly with younger age had greater level of active ageing compare to those older age in Thailand. This is natural because of ageing process and older elderly are more frail in many aspects of life compare to young elderly and this finding is consistent with a study by Chansarn [5] for active ageing index (regarding active ageing goal acheivement) in Thailand. It is not possible to alter some one's age but special focus should be given to older ages because as age increases AAI decreases. Involvement in work, after age 60, can increase income and savings of elderly, and all of these (work, income and savings) are positively correlated with AAI. A substantial proportion of elderly reported either having insufficient income or no savings (result not shown). So, longer working lives may useful for increasing income and hence active ageing level. Savings in older ages is mainly a function of access to resources in earlier stages of life. So, income generating opportunity in working age population and encouraging people in their earlier stages of life to save money may influential to have savings for future elderly, that, in turn, prepare the elderly for their old age and hence it will affect to increase their active ageing level. Results revealed that education is strongly positively correlated with AAI i.e. elderly with well education are higher in AAI; and it is also universally recognized that education is correlated with employment opportunity and with other wellbeing including health [20]. In future, proportion of elderly without education will decrease inevitably (but will remain a proportion of elderly without education) in Thailand and will be very low and equal proportion in all age span of elderly after 2050 [20]. Therefore, any education program such as lifelong learning (e.g. how to cope with illness, how to get access to health facilities) for elderly would be benefited elderly for achieving or accessing opportunities and

hence for achieving higher active ageing level as well. Results revealed a positive and significant correlation between alcohol consumption and AAI for female but positive non-significant for male elderly (i.e. who consumed alcohol are lower in AAI compare to who did not consume). But this finding is contradictory with another study by Chansarn [5] which found opposite result for alcohol consumption and active ageing goals achievement in Thailand.

Social participation is a major determinant factor for explaining variation of active ageing in Thailand. In terms of indicators of social participation determinant factor both community participation and elderly group participation showed positive correlation with active ageing level, meaning that elderly who participated in community and elderly group are more likely to be higher in AAI in Thailand. Therefore, community and elderly group participation programs should be arrange more frequently and should encourage elderly to attend those programs.

CONCLUSIONS

For finding factor structure of active ageing and for estimating active ageing level in Thailand, analysis should be conducted separately for female and male elderly. Findings of the study suggested that the active ageing level of elderly yet to be improved in Thailand as active ageing index (AAI) in Thailand is not high (evidenced as far behind the goal). Policy should be focused for elderly to fulfill health needs, to promote social participation and longer working lives, to arrange education (e.g. lifelong learning) program, and to improve economic security for increasing their active ageing level. Future study (or survey) for measuring AAI should use (or collect) data covering all indicator variables specified in WHO's active ageing model and health related indicator varibles should collect by appropriate medical screening test (s). Moreover, any other existing survey data set (either nationally representative or area based) which includes most of the variables (related to WHO active ageing model) is useful to use in EFA for finding active ageing factor structure and hence active ageing level (e.g. an area based sample survey (at Kanchanaburi, Thailand) for 'Project on Population, Economic, Social, cultural and Long-term Care Surveillance for Thai Elderly People's Health Promotion, 2011' provides many related or proxy variables for using in EFA to find active ageing factor structure and active ageing level). More comprehensive research is needed to find the relationship of alcohol consumption and active ageing level in Thailand.

LIMITATIONS

The main limitation of the study regards to lack of some indicator variables, in the SOPT data set, specified in the WHO theoretical model of active ageing (e.g. Oral health, Medication, Food intake, Continuous care, Mental health care, Violence and abuse, Social Security, Absence of pollution are not available in the data set used in this study). Another limitation of the SOPT data set is the inclusion of self rated indicator variables which led to an overall perceived reality but may not the actual situation (e.g. self-rated health status, happiness level, illness).

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