

# VALIDATION AND RELIABILITY OF THE SHORT VERSION OF ACTIVE AGING SCALE FOR VIETNAMESE ELDERLY ADULTS

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*The aim of our study was to validate the Vietnamese version of the 36 item Active Ageing Scale-Thai (AAS-Thai 36-items). This was a cross sectional study conducted among 502 older adults at Hanoi, Vietnam. We conducted exploratory factor analysis (EFA), confirmatory factor analysis (CFA) to ensure the validity and convergent validity of this proposed measurement model. The Structural Equation Model (SEM) was used to estimate the model. The aim of Cronbach's alpha internal consistency coefficient is to examine the reliability of Likert-4 scales. We used the Latent class analysis (LCA) to measure the levels of active aging by the questionnaire. Results showed that the Vietnamese version of questionnaire consisted of 20 items separated into 6 groups and the cut-off point was 67.5. The 6 groups of AAS are appropriate, concise, orderly, and logic with a simple structure. The Vietnamese version of Active Ageing Scale - 20 - item can be used to classify the adults to active aging levels in Viet Nam.*

**Keywords:** elderly adults, active ageing, validation, Vietnam, classify.

## I. INTRODUCTION

The transition period from “population aging” to “aged population” of Vietnam was only about 15 years, much shorter than developed countries [1]. In 2002, WHO introduced the first active ageing definition. This definition was used popularly. It allows people to realize their potentiality such as physical, social and mental throughout life and to participate in social activities with their demand, desire and ability under protected conditions, information security and provide adequately care services as needed [2].

The elderly adults in low-income and

middle-income countries incur more burden due to illness than high-income countries [3]. Additionally, almost all world health systems are not ready to address the demand of the elderly people who often suffer from chronic diseases or aging syndrome [3]. Therefore, it is necessary to have appropriate policies ready to adapt to population aging.

Active aging has not really been interested in less-developed or developing countries. In Vietnam, there is no research on active aging and no formal tool used to evaluate the status of the ageing active. Therefore, it is necessary to developing a standard, formal and appropriate tool for Vietnamese culture. We tested the Active Ageing Scale in elderly people in Hanoi City, Vietnam to find an active aging screening questionnaire for elderly adults in Vietnam.

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## II. METHODS

### 1. Settings and Participants

A four-stage random sampling method was used to select the study subjects:

1. Selecting districts: 6 in 29 districts of Hanoi was randomly selected, three in the urban area (Dong Da, Long Bien, Nam Tu Liem) and three in the rural area (Dong Anh, Thanh Tri and Thanh Oai).

2. Selecting wards: 2 wards/district, yielding 12 wards for the study.

4. Selecting villages/communities: 3 villages/communities of each, yielding 36 villages/communities.

5. Selecting household and respondents: To interview 15 people in each village/community. One elderly respondent per household, who met the inclusion criteria, was selected. The inclusion criteria were 1) being an older person who is residing in the community, 2) being aged 60 years or older, 3) not suffering severe disabilities, severe dementia, or psychiatric disorders, and 4) being able to understand and speak Vietnamese. If any household had more than one older person who met the inclusion criteria, simple random sampling was conducted by putting all their names in the pool and selecting one. Total 540 people had been choosing to interview. 502/540 people had completed the questionnaire. The response rate was 92.96%.

### 2. Questionnaire

The Active Aging Scale questionnaire was developed and validated at Thailand. We had asked the author to have the permission to validate the Vietnamese version of the questionnaire. The pilot study was conducted with 30 elderly adults in Thach That, Hanoi.

The questionnaire consists of two parts: The Personal characteristics (age, gender, religion,

marital status, education qualification...); This scale has 36 questions which is separated into 7 groups: Being self-reliant (8 items), Being actively engaged with society (8 items), Developing spiritual wisdom (5 items), Building up financial security (4 items), Maintaining healthy lifestyle (5 items), Engaging in active learning (4 items), Strengthening family ties to ensure care in later life (2 items) [4].

### 3. Data Analysis

We used the Kaiser-Meyer-Olkin (KMO) test and Measures of Sampling Adequacy (MSA) to test the suitability of our study sample. The KMO test greater than 0.7 and MSA test greater than 0.5 for each variable mean the sample size was suitable for the factor analysis [5]. The variable had been removed if it did not fulfill these conditionals.

We conducted exploratory factor analysis (EFA) to test the structure of the factor loadings and inter-correlations for all the items and dimensions of the AAS-Thai. The Initial Eigenvalues should be above 1 and the Total Variance Explained more than 60% to accept the number of dimensions [5]. The factor loadings and communality index should both be higher than 0.30 [5].

We utilized confirmatory factor analysis (CFA) to ensure the convergent validity of this proposed measurement model; 3 rules were followed: (1) all of the items in the CFA standardized factor loadings should be higher than 0.60; (2) the values of the composite reliability should exceed 0.70; and (3) the average variance extracted should exceed 0.50. The items that did not fulfill the 3 rules were excluded from further analysis.

To estimate the model, we used the Structural Equation Model (SEM). The indexes to verify the model were: the CMIN/df < 3; the Root Mean Square Error of Approximation

(RMSEA) and the standardized root mean square residual (SRMR) < 0.08; the Goodness of Fit Index (GFI) > 0.90 and the Comparative Fit Index (CFI) > 0.905.

The aim of Cronbach's alpha internal consistency coefficient is to examine the reliability of Likert-type scales. The measuring tool was considered unreliable if the Cronbach's alpha coefficient above 0.6 [5].

**4. Ethical**

All procedures performed in studies involving human participants were in accordance with the ethical standards of conducting a questionnaire study. Informed consent was obtained from all individual participants included in the study.

**II. RESULTS**

**1. Demographic**

The 502 participants were older Vietnamese adults living in communities across 6 districts of Hanoi, Vietnam. More than a half of them (57.2%) were female. Age ranged from 56 to 93 years old, with a mean of 68.3 years old (standard deviation =7.32), and half of them (57.2%) were young elderly, aged from 60 to 69 years old. Most of subjects (75.1%) has No Religion. About three fourths (75.5%) of the subjects were currently married. Almost all had completed high school (49.4%) and primary school (25.9%). The majority did not have income (76.7%) and are not in debt (96.4%). Almost all had congenital disease (76.3%) and the majority was living with their family (91.4%). More than half own their house (51.0%). Almost all are independent for self care (70.3%) and the majority (95.4%) co-habit with adult children. More than a half of the study subjects live in the rural area (53.0%).

**2. Validation of the questionnaire**

**Table 1. The factor analysis result for the questionnaire**

No.	Name	Factor loading	Communality index	AVE	CR	Initial Eigenvalues	Cumulative %	Cronbach's Alpha
1		0.758	0.621					0.820
2	Being self-reliant	0.821	0.704	0.572	0.869	4.860	24.298	0.824
3		0.760	0.585					0.826
4		0.692	0.564					0.823
5		0.745	0.611					0.820
6		0.778	0.645					0.815
7	Being actively engaged with society	0.725	0.626	0.518	0.843	2.629	37.445	0.813
8		0.679	0.604					0.823
9		0.752	0.580					0.821
10		0.657	0.550					0.813
11	Building up financial security	0.865	0.780	0.740	0.895	1.960	47.246	0.817
12		0.873	0.784					0.820
13		0.843	0.773					0.818

No.	Name	Factor loading	Communality index	AVE	CR	Initial Eigenvalues	Cumulative %	Cronbach's Alpha
14	Maintaining a healthy lifestyle	0.787	0.674	0.629	0.836	1.797	56.231	0.822
15		0.805	0.725					0.819
16		0.788	0.754					0.819
17	Engaging in active learning	0.828	0.784	0.670	0.803	1.421	63.338	0.820
18		0.809	0.767					0.820
19	Strengthening family ties to ensure care in later life	0.838	0.787	0.741	0.851	1.056	68.617	0.825
20		0.883	0.805					0.826

After eliminating invalid values, the new AAS questionnaire - consisted of 20 questions- is separated into 6 groups: Being self-reliant (5 items); Being actively engaged with society (5 items); Building up financial security (3 items); Maintaining a healthy lifestyle (3 items); Engaging in active learning (2 items); Strengthening family ties to ensure care in later life (2 items) with Cronbach's Alpha coefficients of each respective field are greater than 0.7 and the Factor loading above 0.5. The results of EFA show that the Initial Eigenvalues of all sections were above 1. Next step, we used CFA to ensure the convergent validity of this proposed measurement model. The values of the composite reliability (CR) exceed 0.70; and the average variance extracted (AVE) exceed 0.50.

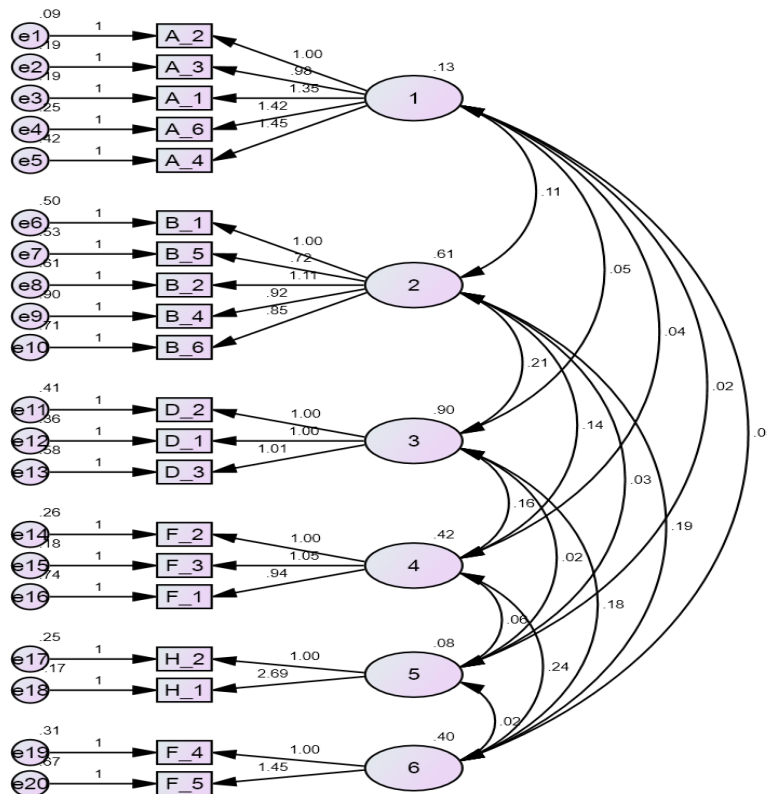


Figure 1. The structural equal modeling results of the questionnaire

The indexes of the model were: CMIN/DF = 3.163; RMSEA = 0.066; SRMR = 0.059; GFI = 0.909; CFI = 0.909.

The SEM demonstrated the association between the questions in the questionnaire, questions in their groups and sections with others. The questionnaire disposed in a sequence and logical groups.

**Table 2. The result of the Latent class analysis (LCA)**

Classification	N	Mean	SD	p-value	Cut-off point	Sensitivity	Specificity	Youden's Index
Class 1	106	71.20	4.72	0.000	67.50	79.2%	6.6%	72.7%
Class 2	129	63.69	3.89		61.50	83.0%	19.5%	63.5%
Class 3	69	60.91	4.26		60.50	81.3%	15.2%	66.1%
Class 4	118	55.02	6.55		56.50	80.6%	12.5%	68.1%
Class 5	80	49.11	6.43		-	-	-	-

There were 5 levels of active aging were found by LCA. The cut - off point was 67.5 with the sensitivity was 79.2% and the specificity was 6.6%. The Youden's Index of the cut-off point was 72.2% which is the highest index. Elderly adults were Active Ageing score  $\geq 67.5$  who was a good Active Ageing level.

#### IV. DISCUSSION

We verified AAS-Thai-36 items and got 20 items regularly. Only 6/7 sectors were regular after the test. Developing spiritual wisdom was rejected. The six areas of AAS are appropriate, concise, orderly, logic with a simple structure. We use the 36-items AAS-Thai is because of the similarity between the two countries such as culture, economy, social, religions and the feasibility of this scale.

Thailand and Vietnam are multi-religious countries, the majority is Buddhist [6; 7]. From 2004, the Thailand's southern region suffered many religious conflicts conducted by extremist religious elements [7]. Conflicts resulted from many reasons such as history, culture, religion, economy, and government mismanagement and neglect [7]. Meanwhile, the religious diversity creates multiform Vietnamese culture. Religious conflicts stemmed from religious diversity are inevitable. Due to the right viewpoint of the State, many religions have been recognized as workers or have appropriate legal measures for unrecognized

religions [6]. Since the religious issue in Vietnam is still controlled by the government, there is no demonstration and terrorism as in Thailand. Therefore, the "Developing spiritual wisdom" group was dropped.

In Thailand, the majority of the elderly receive support from their children about 833 baths per month (equivalent to 626,000 dong) [8]. The pension system of Thailand has been developing since 2009, approximately 90% Thai elderly adults receive pension from the budget tax. The minimum allowance is 600 bath (equivalent to 451,000 dong) [8]. The standard social allowance in Hanoi for the elderly is 350,000 dong. This allowance is lower than Thailand. In Thailand, the study was conducted in 4 regions in the country (central, north, northeast and south). In Vietnam, the study was conducted in 3 districts of Hanoi City. However, the study was randomized and highly representative, with a large sample size.

The 6 areas of AAS were appropriate,

concise, orderly, logic with a simple structure. Based on the results of inspection the AAS 36 items showed that the feasibility of this scale may be applicable to Asian countries. This scale can also be considered as the first screening tool for active aging in Vietnam and can be a prerequisite for the development of new questionnaire.

## V. CONCLUSION

In summary, the AAS -Vietnam 20 - items has 6 groups can use to classify the adults to active aging levels at Vietnamese social.

Based on the results of inspection the AAS 36 items showed that the this questionnaire feasibility may be applicable to Asian countries. This scale can also be considered as the first scale for active aging in Vietnam and can be a prerequisite for the development of a new toolkit.

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