Dependence and Active Life Expectancy of the Elderly Population Living in the Central Region of Thailand

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Abstract

Objective : To determine the prevalence and the independent socio-economic factors with respect to the dependence status of the Thai elderly population living in the central region and to calculate the active life expectancy (ALE) based on the results of this survey and abridged life tables for Thailand.

Design : A cross-sectional mulitistage random sampling survey.

Setting : Communities in the central region, Thailand.

Subjects : 723 elderly subjects.

Results : Mean age and its standard deviation (SD) of the 723 recruited subjects were 69.9 and 7.3 years, respectively. Forty three per cent of the subjects were men. Mean values (SD) of the BAI score and the CAI score were 18.78 (2.6) and 6.47 (2.4), respectively. Except for housework, elderly women had a higher prevalence rate of dependence on activities of daily living (ADL) compared with elderly men. Seven univariate factors of the BAI and the CAI were demonstrated. According to the multiple linear regression analysis by entering all univariate factors of the BAI and the CAI except "working status", independent factors of both the BAI (adjusted $R^2 = 0.051$) and the CAI (adjusted $R^2 = 0.146$) were age, sex and writing ability. The prevalence rate (95% confidence interval) of dependence regarding self-care activities of daily living was 5.9 per cent (4.2-7.6%). The rate of dependence increased with age. The female elderly were more dependent on self care than their male counterparts. Although the elderly women live longer than the elderly men, they spend more years in a severely dependent state. Findings on ratios between health and life expectancy demonstrate that Thai men spend more proportional time leading a healthy life than Thai women.

Conclusion : Prevalence rates of dependence regarding activities of daily living among the Thai elderly living in the Central region were rather high showing the health of elderly women to be worse than that of elderly men. The elderly women spend more years in a severely dependent state although they live longer than the elderly men.

Key word : Disability, Disability-Free Life Expectancy, Elderly, Thai, Epidemiology

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J Med Assoc Thai 2001; 84: 349-356

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During the past twenty years non-communicable mainly incurable diseases have become major health problems among the elderly population in Thailand[1-3]. Many Thai elderly with these chronic diseases are disabled and dependent. They definitely consume a high proportion of both social and health care resources[4-6]. At present the number of Thai elderly is increasing rapidly especially the very elderly. The process of population ageing of Thailand is changing more rapidly than that in the west where the elderly now comprise a remarkable share of the total population[2]. Thus, disability and dependence which are the most serious consequences of disease among Thai elderly population are being concerned by the policy-makers and administrators.

In 1997, an epidemiological survey was conducted aimed at determining prevalence and severity of the dependence status among the Thai elderly population living in the central region of Thailand. The active life expectancy was calculated based on the results of this survey and abridged life tables for Thailand in 1996.

MATERIAL AND METHOD

In 1997, we conducted a multi-stage random cross-sectional survey. The sampling frame was obtained from the National Statistical Office, Office of the Prime Minister. The sampling frame from the population census survey in 1995-1996 was used. A stratified multi-stage sampling was performed. At the first stage eight, provinces of the central region were sampled at random including Kanchanaburi, Chonburi, Saraburi, Ayuthya, Chacheungsao, Samutrprakan, Samutrsakorn and Prachuabkirikhan. At the second stage, villages and communities were stratified sampled according to municipal and non-municipal areas (61 villages/communities). At the third stage, 15 elderly people aged 60 years and over in each village and community were then sampled at random. Therefore, 915 subjects were sampled. All sampled subjects were visited at their own houses. They and their caretakers or family members were told about the objective of this survey. Repeated visits were made as required. However, only 723 subjects (79%) were able to be contacted and interviewed.

Data on dependence was collected using a structured questionnaire administered by trained interviewers. Data on socio-economic characteristics, basic activities of daily living using the modified Barthel ADL Index (BAI)[7,8], and instrumental activities of daily living using the Chula ADL Index (CAI)[9] were collected.

The prevalence of dependence as to each activity of daily living (ADL) and the means (standard deviations) of the BAI and the CAI were computed. Univariate socio-economic factors of the BAI and the CAI were determined using the Krukal-Willis test or Mann Whitney-U test where appropriate. Those associations with a statistical significance meeting a p-value of 0.05 or less were entered into a multiple linear regression analysis using the BAI and CAI as the dependent variable.

Need for assistance with self-care activities of daily living (feeding, grooming, transferring, toileting, dressing and bathing) was assessed. Prevalence of dependence regarding self-care acti-

Table 1. Characteristics of 723 elderly subjects recruited in the study.

	Number	%
Age		
60-69	401	55.5
70-79	233	32.2
80+	89	12.3
Gender		
Male	313	43.3
Female	410	56.7
Area of residence		
Municipal	241	33.3
Not-municipal	482	66.7
Marital status		
Single	27	3.7
Married	446	61.7
Separated	18	2.5
Widowed	222	30.7
Divorced	10	1.4
Status of living		
Alone	42	5.8
With family or relatives	679	93.9
With non-relatives	2	0.3
Education level		
Less than grade 4	292	40.4
Grade 4	358	49.5
Higher than grade 4	73	11.1
Literacy-reading		
Literate	344	47.6
Literate with difficulty	209	28.9
Illitarate	170	23.5
Literacy-writing		
Literate	312	43.2
Literate with difficulty	223	30.8
Illitarate	188	26
Working status		
Work	220	30.4
No	503	69.6
Adequacy of income		
Seriously inadequate	13	1.8
Inadequate	119	16.5
Inadequate only in some occasion	241	33.3
Adequate	350	48.4

Table 2. Univariate factors of the BAI and the CAI of all 723 elderly subjects.

	Mean BAI score (SD)	Mean CAI score (SD)
Age		
60-69	19.1 (2.1)*	7.1 (2)*
70-79	18.7 (2.9)	6.2 (2.3)
80+	17.7 (3.4)	4.3 (2.8)
Gender		
Male	19.2 (1.6)*	6.3 (2.1)**
Female	18.4 (3.1)	6.6 (2.6)
Marital status		
Single	18.8 (2.9)*	7 (2.5)***
Married	19 (2.3)	6.6 (2.2)
Widowed-Separated-Divorced	18.4 (2.9)	6.1 (2.7)
Education level		
Less than grade 4	18.4 (3)*	6 (2.6)*
Grade 4	19 (2.1)	6.7 (2.2)
Higher than grade 4	19.1 (2.7)	7.1 (2.1)
Literacy-reading		
Literate	19.1 (2.1)**	6.7 (2.1)**
Literate with difficulty	18.7 (2.7)	6.6 (2.3)
Illitarate	18.3 (3.1)	5.8 (2.8)
Literacy-writing		
Literate	19.1 (2.1)*	6.8 (2)*
Literate with difficulty	18.9 (2.2)	6.6 (2.4)
Illitarate	18.1 (3.4)	5.7 (2.8)
Working status		
Work	19.3 (1.2)*	7.2 (1.6)*
No	18.5 (2.9)	6.1 (2.6)

* $p < 0.000$
** $p < 0.005$
*** $p < 0.05$

vities of daily living were computed by age and sex and used for calculating the active life expectancy (ALE)[10,11]. An abridged life table of 1996 was obtained from the National Statistical Office[12] and used for calculation according to the Sullivan method[13]. The SPSS-PC (version 8.0) was used for statistical analysis.

RESULTS

The mean age and its standard deviation (SD) of the 723 recruited subjects were 69.9 and 7.3 years, respectively. Of 723 subjects, 241 (33.3%) were in municipal areas. Forty three per cent of the subjects were men (n = 313). (Table 1) The mean values (SD) of the BAI score and the CAI score were 18.78 (2.6) and 6.47 (2.4), respectively. The percentages of elderly with a BAI score below 5 and 12 were 0.8 and 2.8, respectively. The percentages of elderly with a CAI score below 3 and 6 were 7.6 and 25.9, respectively. (Fig. 1) The prevalence of dependence on activities of daily living by sex are shown in Fig. 2. Except for housework, elderly women had a higher prevalence rate of dependence on ADLs compared to elderly men.

Seven univariate factors of the BAI and the CAI were demonstrated. (Table 2) All univariate factors were entered into a multiple linear regression analysis. Independent factors of the BAI (adjusted $R^2 = 0.056$) were age, sex, working status and wrting ability. Independent factors of the CAI

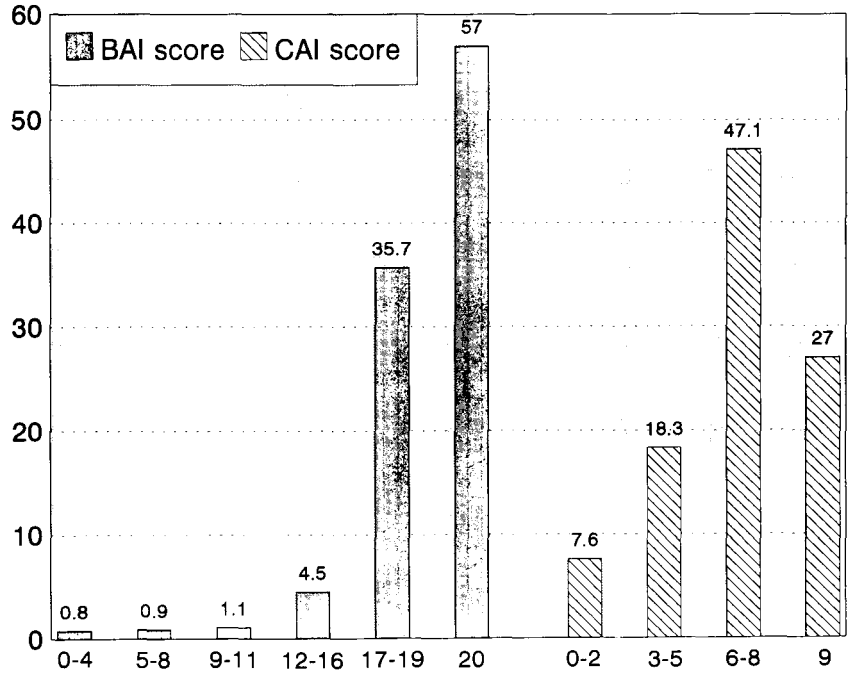
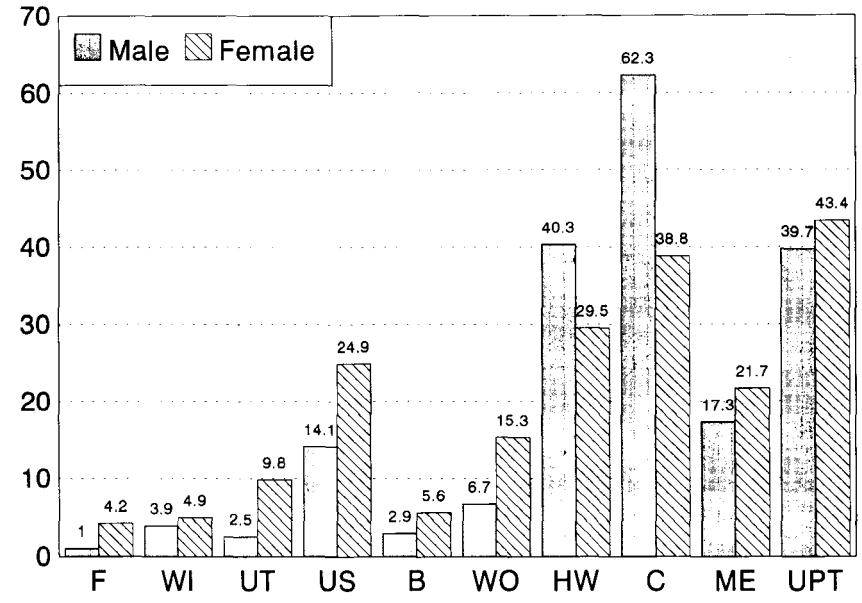


Fig. 1. Distribution (%) of the elderly subjects according to their BAI and CAI scores.



F=feeding; WI=walking indoors; UT=using toilet; US=using stairs; B=bathing; WI=walking outdoors; HW=heavy housework; C=cooking; ME=money exchange; UPT=use of public transport

Fig. 2. Prevalence rate (%) of dependence as to selected activity of daily living by sex.

Table 3. Multiple linear regression model using the BAI and CAI score as dependent factors.

Factors entered	Models
All univariate factors	BAI score = 21.66 - 0.41(age group*) - 0.6 (sex**) - 0.5 (working status***) - 0.26 (writing ability****)
	CAI score = 7.58 - 1.02 (age group*) + 0.52 (sex**) - 0.61 (working status***) + 0.43 (education level#)
All univariate factors except "working status"	BAI score = 21.05 - 0.51(age group*) - 0.64 (sex**) - 0.26 (writing ability***)
	CAI score = 8.11 - 1.13 (age group*) + 0.5 (sex**) - 0.36 (writing ability***)

* Age group was categorized as "60-69" = 1; "70-79" = 2; "80 up" = 3.
** Sex was categorized as "male" = 1; "female" = 2.
*** Working status was categorized as "working" = 1; "no" = 2.
**** Writing ability was categorized as "can" = 1, "can but uncomfortable" = 2, "cannot or illiterate" = 3.
\# Education level was categorized as "less than grade 4" = 1; "grade 4" = 2; "higher than grade 4" = 3.

Table 4. Prevalence rates of dependence as to self-care activities of daily living, life expectancy (LE), active life expectancy (ALE) and the ratios of ALE *versus* LE (%) by age and sex of Thai female elderly living in the central region.

	Male				Female			
	Dependence rate (%)	LE	ALE	% ALE/LE	Dependence rate (%)	LE	ALE	% ALE/LE
60 - 64	2.1	20.5	19.44	94.83	2.8	23.26	20.95	90.07
65 - 69	2.6	16.91	15.87	93.85	4.1	19.37	17.09	88.23
70 - 74	2.9	13.4	12.39	92.46	11.7	15.51	13.28	85.62
75 - 79	2.2	11.4	10.28	90.17	7	13.26	11.2	84.46
80 +	14.3	10.76	9.22	85.69	19.7	11.66	9.36	80.27

(adjusted R^2 = 0.152) were age, sex, working status and education level. The models are shown in Table 3.

Repeated multiple linear regression analysis was performed by entering all univariate factors except "working status". Independent factors of both the BAI (adjusted R^2 = 0.051) and the CAI (adjusted R^2 = 0.146) were age, sex and writing ability. (Table 3)

The prevalence rate (95% confidence interval) of dependence on self-care activities of daily living was 5.9 per cent (4.2-7.6%). The rate of dependence increased with age. The female elderly were more dependent on self care than their male counterparts. (Table 4) Life expectancy and active life expectancy of Thai elderly living in the central region graded by age and sex are shown in Table 4. Although elderly women live longer than elderly men, they spend more years in a severely dependent state. Findings on ratios between health and life expectancy demonstrate that Thai men spend more proportional time leading a healthy life than Thai women. (Table 4) Whereas the importance of the gap between the sexes in ALE seems to diminish with age, the proportional time of dependence of both men and women increases with age.

DISCUSSION

Having applied a sampling frame obtained from the routine national census survey produced by the National Statistic Office, Office of the Prime Minister as well as a high response rate suggested the sampled population of this study represent all Thai elderly living in the central region.

The prevalence of disability among the Thai elderly was rather high but not unexpectedly so. It has been reported that Thai elderly with a BAI score below 5 and 12 amounted to 0.7 per cent and 1.6 per cent, respectively, a slightly lower percen tage than in our findings[14]. However, the

previous study had been conducted in a slum area in Bangkok in 1992. Women were more dependent on basic and self-care activities than men which suggests that Thai female elderly suffer more from disability than their male counterparts. Only regarding house-work activities men had higher prevalence rates than women which caused the male sex to be an independent factor for a high CAI score. This finding may be explained by the Thai culture where women are always responsible for housework. Apart from age and sex, literacy was found to be an independent factor for disability measured by both the BAI and the CAI. Literacy may be an index of poor socioeconomic status or a low opportunity to get proper health care and suggests an inequality in health among this population.

Nearly 6 per cent of the Thai elderly population required assistance or supervision with self-care activities. The rate of dependence increased with age and was predominant in women. These disabled individuals inevitably consume high amounts of resources and are the concern of both health care workers and the Ministry of Public Health[4,5,15]. Improvement of primary health care and comprehensive community care is encouraged [1].

Although ALE, like life expectancy, remains higher in Thai women, Thai men spend a marginally smaller proportion of their life in poor health than women do[16]. Therefore, though women may live longer, a slightly larger proportion of their life is probably spent in some state of disability. In other words, the health of elderly women is worse than that of elderly men.

ACKNOWLEDGEMENT

This project was carried out with collaboration of the Ministry of Public Health of Thailand and the Thailand Health Research Institute, National Health Foundation. The authors wish to thank the Ministry of Public Health and the National Health Foundation for their generous support of this research. We also thank all members of the Administrative Committee and the Technical Committee of this project. Furthermore, we would like to thank Ms. Petra Hirsch for editing the manuscript.

(Received for publication on September 29, 1999)

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ภาวะพึ่งพาและอายุคาดหวังที่ยังช่วยเหลือตนเองได้ของผู้สูงอายุในเขตภาคกลางของประเทศไทย

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วัตถุประสงค์ : เพื่อศึกษาความชุกและปัจจัยทางเศรษฐกิจและสังคมของภาวะพึ่งพาในประชากรสูงอายุไทยในเขตภาคกลาง และเพื่อคำนวณอายุคาดหวังที่ยังช่วยเหลือตนเองได้โดยอาศัยข้อมูลจากการศึกษาและตารางชีพของประเทศไทย

รูปแบบการศึกษา : การศึกษาตัดขวางโดยการสุ่มตัวอย่างแบบหลายขั้นตอน

พื้นที่ศึกษา : ชุมชนในเขตภาคกลางของประเทศไทย

ประชากรศึกษา : ผู้สูงอายุจำนวน 723 คน

ผลการศึกษา : อายุเฉลี่ยและส่วนเบี่ยงเบนมาตรฐานของผู้สูงอายุ 723 คนเท่ากับ 69.9 และ 7.3 ปี ตามลำดับ ร้อยละ 43 เป็นผู้ชาย ค่าเฉลี่ย (ส่วนเบี่ยงเบนมาตรฐาน) ของดัชนีบาร์เธลเอดีแอล และดัชนีจุฬาเอดีแอลเท่ากับ 18.78 (2.6) และ 6.47 (2.4) ตามลำดับ นอกเหนือจากงานบ้านผู้สูงอายุหญิงมีอัตราความชุกของภาวะพึ่งพาในกิจวัตรประจำวันสูงกว่าผู้สูงอายุชาย จากการวิเคราะห์พบปัจจัยชนิด univariate ของดัชนีบาร์เธลเอดีแอลและดัชนีจุฬาเอดีแอลจำนวนเจ็ดปัจจัย และโดยการใช้การวิเคราะห์ถดถอยพหุคูณโดยการใส่ปัจจัยชนิด univariate ยกเว้น "สถานะการทำงาน" เข้าไปในกระบวนการวิเคราะห์ทำให้ได้ปัจจัยอิสระของทั้งดัชนีบาร์เธลเอดีแอล (adjusted R^2 = 0.051) และดัชนีจุฬา–เอดีแอล (adjusted R^2 = 0.146) จำนวนสามปัจจัยได้แก่ อายุ เพศ และความสามารถในการเขียน อัตราความชุก (95% confidence interval) ของการพึ่งพาในกิจวัตรประจำวันชนิดดูแลสุขลักษณะตนเองเท่ากับร้อยละ 5.9 (4.2–7.6) พบว่าอัตราของการพึ่งพาเพิ่มขึ้นเมื่ออายุมากขึ้น และพบอัตราในผู้หญิงสูงกว่าผู้ชาย จากการศึกษายังพบว่าถึงแม้ผู้สูงอายุหญิงจะมีอายุคาดหวังสูงกว่าผู้สูงอายุชายแต่กลับใช้เวลาในระยะพึ่งพาที่นานกว่า จากการคำนวณหาสัดส่วนระหว่างอายุคาดหวังทางสุขภาพและอายุคาดหวังแสดงชัดเจนว่าผู้สูงอายุชายมีสุขภาพที่ดีกว่าเมื่อเปรียบเทียบกับผู้สูงอายุหญิง

สรุป : ภาวะพึ่งพาในผู้สูงอายุในเขตภาคกลางมีอัตราความชุกที่ค่อนข้างสูง และผู้สูงอายุหญิงมีสถานะทางสุขภาพที่แย่กว่าผู้สูงอายุชาย ถึงแม้ผู้สูงอายุหญิงจะมีชีวิตที่ยืนยาวกว่าผู้สูงอายุชายแต่กลับต้องใช้ชีวิตในระยะที่ต้องพึ่งพานานกว่าชัดเจน

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จดหมายเหตุทางแพทย์ ฯ 2544; 84: 349–356

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