

## **CHAPTER IV**

### **RESULT**

This study was as an analytic cross-sectional study designs which aimed to estimated prevalence and determine dementia in elderly people who lived in Lampang province. The sample size derived from stratified multi stage sampling obtained 440 cases. They were elders who lived in Lampang province and met inclusion criteria in study. Data were collected during August - November 2013. The instruments in this study were a questionnaire, which base on conceptual framework and research objectives and dementia screening test. In this chapter, the findings were presented following six parts.

Part 1 Dementia assessed by the Mini-Mental State Examination (MMSE-Thai 2002) and the modified informant questionnaire on cognitive decline in the elderly (modified IQCODE).

Part 2 Demographic characteristics consisted of 8 items include gender, age, marital status, education level, occupational, income, daily activity level and life event.

Part 3 Family factors consisted of 3 items include family member had history of dementia, living arrangement and caregiver.

Part 4 Risk factors consisted of 9 items include smoking, alcohol consumption, physical activity, drugs usage, supplement usage, hormone usage, vitamin usage, food consumption and history of exposure to organic solvents.

Part 5 Clinical factors consisted of 5 items include hypertension, diabetes, dyslipidemia, body mass index, history of depression and history of head injury.

Part 6 Associated between demographic characteristic, family factors, risk factors and clinical factors with dementia in elderly.

## **Part 1 Dementia assessed by the Mini-Mental State Examination (MMSE-Thai 2002) and the modified informant questionnaire on cognitive decline in the elderly (modified IQCODE)**

The Mini-Mental State Examination (MMSE-Thai 2002) had three cutoff point depended on educational background of the elderly persons: uneducated, primary school and higher than primary school. The final score of 14 for uneducated person, 17 for who completed primary school and 22 for who completed higher than primary school.

The modified informant questionnaire on cognitive decline in the elderly (modified IQCODE) consisted of 32 items. The modified IQCODE scores was calculated by averaging the response for all items. The average of total scores ranged from 1-5. The higher score individual got, the greater impairment he/she would have.

Elders who got the total score below the corresponding cut-off point or got the cutoff score below 3.33 was typically identified as a dementia case.

In this study, of total 440 participations, it found that prevalence of dementia was 35.5% (156 peoples). (Table 4.1)

**Table 4.1** Number and percentage of Aging in Lampang province as categorized according to dementia (n=440)

<b>Dementia</b>	<b>Number</b>	<b>Percentage</b>
No	284	64.5
Yes	156	35.5

## **Part 2 Demographic characteristics consisted of 8 items include gender, age, marital status, education level, occupational, income, daily activity level and life event**

The characteristic of study subject showed in table 4.2 and table 4.3 following as:

Around 68.9% of study subjects were female and 31.1% were male. The most group was ranged from 71-80 years old (42.0%), Mean of age were 76 years old (SD= 8.29). Maximum of group were 99 years old and minimum of group were 61 years old, about 29.1% of them were 61-70 years old and about 28.9% of them were more than 80 years old which were the small group.

Marital status of participants in this study showed that 50.5% were married, about 48.0% of them were separated, divorced or widowed and about 1.5% of them were single which the small group.

Education level of participants, the most of group 61.1% were educated from primary level, 32.5% of them were no education, 3.9% of them secondary school, 1.6% of them were higher than bachelor's degree level and 0.9% of them were bachelor's degree level which were the small group.

Most of participants with occupation (before 60 years old) were working person (95.9%). Job characteristic of participants, the most of group were labor (91.6%), 3.2% of them were academic/ creative and 1.4% of them were skill. The employment status showed that agriculturist 65.3%, 13.0% were freelance and 11.3% were trader.

About half of participants with occupation (after 60 years old) were did not work (57.3%). Most of participants with job characteristics were labor (90.4%). The employment status showed that agriculturist 65.3%, 13.0% were freelance and 11.3% were handmade.

Income of participants, the most of group 72.7% were lower than 1,000 bath/ month, participants about 17.3% were range from 1,000-2,000 bath/month and participants about 3.9% were range form 1,000-2,000 bath/month. This study found that most of participants' incomes receive from subsistence allowance.

Life crisis event following participates who reported crisis following paternal parental death were 98%. The most of age group range from 21-40 years old (31.1%). Crisis following maternal parental death were 96.6% and most of age group ranged from 41-60 years old were 33.4%. Participants who reported crisis following spouse death were 55.9%, about 77.7% of participants who were reported crisis following child death. These studies found only 3.2% of elders were parental separation.

Daily activity level of participants, the most of group 51.4% were excellence, 39.8% were good and 8.8% were fair/poor.

**Table 4.2** Number and percentage of elderly in Lampang province as categorized according to demographic characteristics (n = 440)

Demographic characteristics	Number	Percentage
Gender		
Male	137	31.1
Female	303	68.9
Age (years)		
61-70	128	29.1
71-80	185	42.0
>80	127	28.9
Mean = 75.82 SD = 8.29 Min = 61 years Max = 99 years		
Marital status		
Single	7	1.5
Married	222	50.5
Separated/Divorced/Widowed	211	48.0
Education level		
No education	143	32.5
Primary school	269	61.1
Secondary school	17	3.9
Bachelor's degree	4	0.9
Higher than bachelor's degree	7	1.6
Occupation		
<i>Occupation (before 60 years old)</i>		
Working person	423	95.9
Non working person	18	4.1
<i>Job characteristic (n=423)</i>		
Labor	403	91.6
Academic/Creative	14	3.2
Skill	6	1.4

**Table 4.2** Number and percentage of elderly in Lampang province as categorized according to demographic characteristics (n = 440) (cont.)

<b>Demographic characteristics</b>	<b>Number</b>	<b>Percentage</b>
<i>Occupational category (n = 423)</i>		
Agriculturist	276	65.3
Freelance	55	13.0
Trader	48	11.3
Employee	16	3.8
Handmade	13	3.1
Government employee	11	2.6
Domestic animal	4	0.9
<i>Occupation (after 60 years old)</i>		
Working person	188	42.7
Non working person	252	57.3
<i>Job characteristic (n=188)</i>		
Labor	170	90.4
Academic/ Creative	14	7.5
Skill	4	2.1
<i>Occupational category (n = 188)</i>		
Agriculturist	111	59.0
Freelance	30	16.0
Handmade	22	11.7
Trader	21	11.2
Domestic animal	2	1.1
Employee	1	0.5
Painter	1	0.5
<i>Income (bath/month)</i>		
Lower than 1,000	320	72.7
1,000-2,000	76	17.3
2,001-3,000	17	3.9
3,001-4,000	8	1.8

**Table 4.2** Number and percentage of elderly in Lampang province as categorized according to demographic characteristics (n = 440) (cont.)

Demographic characteristics	Number	Percentage
Higher than 4,000	19	4.3
Mean = 1333.32 SD = 2265.49 Min = 600 years Max =24000		
Life crisis event		
<i>Crisis Following Parental Death- Paternal</i>		
Yes	431	98.0
No	9	2.0
Age at		
<i>Crisis Following Parental Death-Paternal (year) (n = 431)</i>		
0-12	96	22.3
13-20	46	10.6
21-40	134	31.1
41-60	115	26.7
>60	40	9.3
<i>Crisis Following Parental Death-Maternal</i>		
Yes	425	96.6
No	15	3.4
Age at		
<i>Crisis Following Parental Death- Maternal (year) ( n = 425)</i>		
0-12	61	14.4
13-20	33	7.8
21-40	126	29.6
41-60	142	33.4
>60	63	14.8
<i>Crisis Following Child Death</i>		
Yes	98	22.3
No	342	77.7

**Table 4.2** Number and percentage of elderly in Lampang province as categorized according to demographic characteristics (n = 440) (cont.)

<b>Demographic characteristics</b>	<b>Number</b>	<b>Percentage</b>
Parental separation		
Yes	14	3.2
No	422	95.9
Daily Activity level		
Excellence	175	39.8
Good	226	51.4
Fair/Poor	39	8.8

This study found a few of elderly clubs in community. Therefore, leisure Activities of participates who never participate with elderly club were 34.1%. Other leisure Activities were 75.4 % of them always visited neighborhood, participations who always participating in village traditions were 77.3% and participates who always had religious activities were 55.9% as showed in table 4.3.

**Table 4.3** Number and percentage of elderly in Lampang province as categorized according to demographic characteristics (n = 440)

<b>Demographic characteristics</b>	<b>Never</b>		<b>Sometime</b>		<b>Always</b>	
	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>
Leisure Activities						
Participating in village traditions	39	8.9	61	13.9	340	77.3
Visiting neighborhood	36	8.2	72	16.4	332	75.4
Religious activities	34	7.7	160	36.4	246	55.9
Participating in elderly club	150	34.1	146	33.2	144	32.7

### **Part 3 Family factors consisted of 3 items include family member had history of dementia, living arrangement and caregiver**

The characteristic of study subject showed in table 4.4 following as in this study showed that 84.1% of participations did not enough social support. The number of participants with family member had history of dementia were 24 person (5.6 %) and 94.4% of them group did not have family member had history of dementia. Most of participates lived with other (54.1%), lived with spouse were 40.5% of them group and lived alone were 5.5% of them group.

**Table 4.4** Number and percentage of elderly in Lampang province as categorized according to family factors (n = 440)

<b>Family factors</b>	<b>Number</b>	<b>Percentage</b>
Caregiver support		
Enough	370	84.1
Not enough	70	15.9
Family member had history of dementia		
Yes	24	5.5
No	407	92.5
Unknown	9	2.0
Living arrangement		
Alone	24	5.5
With other	238	54.1
With spouse	178	40.5

**Part 4 Risk factors consisted of 9 items include smoking, alcohol consumption, physical activity, drugs usage, supplement usage, hormone usage, vitamin usage, food consumption and history of exposure to organic solvents**

The characteristic of study subject showed in table 4.5, table 4.6 and table 4.7 following as.

In this study showed that the most of participants were non smoke (42.7%), when considered each domain of secondhand smoke status, among those with participants who never smoke, it found 81.9% of them group were current secondhand smoke (16%).

More than half of participants did not drink alcohol (63.9%). A few of participants were current drinking alcohol status (9.5%) and 26.6% of participants were former drinking alcohol status. This study found that the most of participations who did not have history of exposer to organic solvent (62%) and only 38% of them group had history of exposer to organic solvent.

**Table 4.5** Number and percentage of elderly in Lampang province as categorized according to risk factors (N=440)

<b>Risk factors</b>	<b>Number</b>	<b>Percentage</b>
Smoking status		
Never	188	42.7
Current	68	15.5
Former	184	41.8
Secondhand Smoke status		
<i>Among those with never smoking status (n = 218)</i>		
Never	154	81.9
Current	30	16.0
Former	4	2.1

**Table 4.5** Number and percentage of elderly in Lampang province as categorized according to risk factors (N=440) (cont.)

<b>Risk factors</b>	<b>Number</b>	<b>Percentage</b>
<i>Among those with former smoking status (n = 184)</i>		
Never	155	84.2
Current	26	14.1
Former	3	1.6
Alcohol consumption		
Never	281	63.9
Current	42	9.5
Former	117	26.6
History of exposure to organic solvent		
No	273	62.0
Yes	167	38.0

When considering each domain of physical activity, it was found that 43.6% of them group were sometime exercise, 31.8% never exercise and 24.5% always exercise. Sometime doing housework were 59.8% of them group, participations who always doing housework were 23.0% and 17.3% of them group were never doing housework. Half of participations were never walking (50%), 40% of them group were participations who sometime walking and 10% of them group were always walking. as showed in Table 4.6.

**Table 4.6** Number and percentage of elderly in Lampang province as categorized according to risk factors (n = 440)

Risk factors	Never		Sometime		Always	
	n	%	n	%	n	%
Physical activities						
Exercise	140	31.8	192	43.6	108	24.5
Doing housework	76	17.3	263	59.8	101	23.0
Walk	220	50.0	176	40.0	44	10.0

**Table 4.7** Number and percentage of elderly in Lampang province as categorized according to risk factors (n = 440)

Risk factors	Rarely/Never		Sometime		Always	
	n	%	n	%	n	%
Food consumption						
Fat intake	65	14.8	319	72.5	56	12.7
Fiber intake	9	2.0	205	46.6	226	51.4
Dessert intake	369	83.9	58	13.2	13	3.0
Fish intake	127	28.9	235	53.4	78	17.7
Non-steroidal anti-inflammatory drug usage	380	86.4	49	11.1	11	2.5
Supplement usage	369	90.0	28	6.4	16	3.6
Vitamins usage	314	71.4	60	13.6	66	15.0

### **Part 5 Clinical factors consisted of 5 items include hypertension, diabetes, dyslipidemia, body mass index, history of depression and history of head injury**

The characteristic of study subject showed in table 4.8 following as.

1. Hypertension: Half of them group were not hypertension (52%). About 46.8% of elders were hypertension, when considering each items of main treatment of

hypertension, it found that most of them group were treated with hypertensive drugs (91.7%) and about 99.5% were continually hypertensive drugs.

2. Diabetes: The most of them having diabetes mellitus (82.7%). About 16.6% having diabetes mellitus and the most of total 206 participants were treated with drugs (89%) or diet (11%).

3. Dyslipidemia: The most of them were not dyslipidemia (76.1%). About 22.7% were dyslipidemia, the most of them treated with antihyperlipidaemic drugs (89%) and about 97.6% of elders who were dyslipidemia continually antihyperlipidaemic drugs.

4. History of depression: In this study showed that most of them did not have history of depression (98.2%) and all of participants who had history of depression treated with drugs and continually antidepressants drugs.

5. History of head injury: In this study showed that most of them did not have history of head injury (87.7%) and when considering each items of severity of head injury, it found that 56.3% of them group were mild level, about 25.5% of them group were moderate level and about 18.2% of them were severe level.

6. Body mass index (BMI): This study showed that about 47.7% of participations were normal (18.5-23.9 kg/m<sup>2</sup>), about 28.2% of them were underweight (<18.5 kg/m<sup>2</sup>), about 17.3% of them were overweight (24-26.9 kg/m<sup>2</sup>) and about 6.8% of them were obesity (>27 kg/m<sup>2</sup>).

**Table 4.8** Number and percentage of elderly in Lampang province as categorized according to clinical factors (n = 440)

Clinical factors	Number	Percentage
Hypertension		
Yes	206	46.8
No	229	52.0
Unknown	5	1.1
Main Treatment of hypertension (n=206)		
Drug	189	91.7
Diet	10	4.9
No	7	3.4

**Table 4.8** Number and percentage of elderly in Lampang province as categorized according to clinical factors (n = 440) (cont.)

Clinical factors	Number	Percentage
Continuity to used hypertensive drugs (n=189)		
Yes	188	99.5
No	1	0.5
Diabetes		
Yes	73	16.6
No	364	82.7
Unknown	3	0.7
Main Treatment of diabetes (n=73)		
Diet	8	11.0
Drug	65	89.0
Continuity to used antidiabetic drugs (n=65)		
Yes	64	98.5
No	1	1.5
Dyslipidemia		
Yes	100	22.7
No	335	76.1
Unknown	5	1.1
Main Treatment of Dyslipidemia (n=100)		
Drug	84	84
Diet	12	12
No	4	4
Continuity to used antihyperlipidaemic drugs (n=84)		
Yes	82	97.6
No	2	2.4
History of Depression		
Yes	4	0.9
No	432	98.2
Unknown	4	0.9

**Table 4.8** Number and percentage of elderly in Lampang province as categorized according to clinical factors (n = 440) (cont.)

Clinical factors	Number	Percentage
Main Treatment of depression		
Drug	0	0
Diet	0	0
No	4	100
Continuity to used antidepressants drugs		
Yes	4	100
No	0	0
History of head injury		
No	385	87.7
Yes	55	12.3
Severity of Head injury (n=55)		
Mild	31	56.3
Moderate	14	25.5
Severe	10	18.2
Body mass index (BMI)		
<18.5 kg/m <sup>2</sup>	124	28.2
18.5-23.9 kg/m <sup>2</sup>	210	47.7
24-26.9 kg/m <sup>2</sup>	76	17.3
>27 kg/m <sup>2</sup>	30	6.8

### **Part 6 Associated between demographic characteristic, family factors, risk factors and clinical factors with dementia in elderly**

The present study investigated the association. The univariate analysis by unconditional logistic regression and multivariate analysis by multiple logistic regression were used for data analysis.

### Univariate analysis by unconditional logistic regression

Demographic characteristics of elderly including gender, age, marital status, education level, income, occupational, daily activity level and life event.

Demographic characteristics, it was found that the factors that significant association with dementia who were operated included age, marital status, education level, occupation (after 60 years old), income, daily activity level, crisis follow child death and leisure activity. (Table 4.9)

This study showed that elderly who aged ranged from 71-80 years old and higher than 80 years old are more likely to have dementia

This study present elders with marital status were single, separated, divorced or windowed are more likely to have dementia.

It showed that elders who had income less than 1,000 bath/month and income ranged to 1,000-2,000 bath/month are more likely to have dementia.

It was found elders who did not have still with their work are more likely to have dementia.

This study presented elders who had life event of following child death are more likely to have dementia.

Elders who studied in primary school are more likely to have dementia.

It showed that elders volunteer who had good and fair/poor daily activity level are more likely to have dementia.

It was found that elders who did not have leisure activities are more likely to have dementia.

Gender factors did not significant associated with dementia in elders.

**Table 4.9** Percentage and crude odds ratio for demographic characteristics with dementia by unconditional logistic regression analysis

Factor	Total		Dementia				Odds ratio	95%CI	p-value*
	n	%	yes		no				
			n	%	n	%			
Gender									
Male	137	31.1	42	30.7	95	69.3	1.00	0.89-2.10	0.158
Female	303	68.9	114	37.6	189	62.4	1.36		

**Table 4.9** Percentage and crude odds ratio for demographic characteristics with dementia by unconditional logistic regression analysis (cont.)

Factor	Total		Dementia				Odds ratio	95%CI	p-value*
	n	%	yes		no				
			n	%	n	%			
Age (years)									
61-70	128	29.1	23	18.0	105	82.0	1.00	1.37-4.06	0.002
71-80	185	42.0	63	34.1	122	65.9	2.36	3.17-9.92	<0.001
>80	127	28.9	70	55.1	57	44.9	5.61		
Marital status									
Married	222	50.5	67	30.2	155	69.8	1.00		
Single/Separated/ Divorced/ Windowed	218	49.5	89	40.8	129	59.2	1.60	1.08-2.37	0.020
Education level									
Primary school	269	61.1	73	27.1	196	72.9	1.00		
No education	143	32.5	78	54.5	65	45.5	3.22	2.11-4.93	<0.001
Higher than Primary school	28	6.4	5	17.9	23	82.1	0.58	0.21-1.59	0.293
Daily activity level									
Excellence	175	39.8	38	21.8	137	78.2	1.00		
Good	226	51.4	86	38.1	140	61.9	2.21	1.41-3.47	0.001
Fair/Poor	39	8.8	32	82.1	7	17.9	16.48	6.75-40.27	<0.001
Income (bath/month)									
Higher than 2,000	44	10.0	6	13.6	38	86.4	1.00		
1,000-2,000	76	17.3	32	42.1	44	57.9	4.61	1.74-12.20	0.002
Lower than 1,000	320	72.7	118	36.9	202	63.1	3.70	1.52-9.01	0.004
Occupation (before 60 years old)									
Working person	423	96.1	147	34.8	276	65.2	1.00		
Non working person	17	3.9	9	52.9	8	47.1	1.68	0.67-4.22	0.272
Category (n=423)									
Government employee/ Employee	44	10.0	13	29.5	31	70.5	1.00		
Freelance/Trader	103	23.4	24	23.3	79	76.7	0.72	0.33-1.60	0.425
Agriculturist/Handmade/ Domestic animal	293	66.6	119	40.6	174	59.4	1.63	0.82-3.25	0.159

\*Test significant at 95% confidence interval by chi-square test, p-value &lt; 0.05

**Table 4.9** Percentage and crude odds ratio for demographic characteristics with dementia by unconditional logistic regression analysis (cont.)

Factor	Total		Dementia				Odds ratio	95%CI	p-value*
	n	%	yes		no				
			n	%	n	%			
Job characteristic (n=423)									
Academic/ Creative/Skill	20	4.7	3	15.0	17	85.0	1.00		
Labor	403	95.3	144	35.7	256	64.3	0.32	0.09-1.10	0.071
Occupation (after 60 years old)									
Working person	188	42.7	56	29.8	132	70.2	1.00		
Non working person	252	57.3	100	39.7	152	60.3	1.57	1.05-2.35	0.027
Category (n=188)									
Freelance/Trader/Painter/ Government employee/ Employee	53	28.2	19	35.8	34	64.2	1.00		
Agriculturist/Handmade/ Domestic animal	135	71.8	37	27.4	98	72.6	0.68	0.34-1.33	0.256
Job characteristic (n=188)									
Academic/Creative/Skill	18	9.6	3	16.7	15	83.3	1.00		
Labor	170	90.4	53	31.2	117	68.8	0.44	0.12-1.59	0.211
Crisis Following Parental Death- Paternal									
No	9	2.0	3	33.3	6	66.7	1.00		
Yes	431	98.0	153	35.5	278	64.5	1.10	0.27-4.46	0.893
Crisis Following Parental Death- Maternal									
No	15	3.4	5	33.3	10	66.7	1.00		
Yes	425	96.6	151	35.5	274	64.5	1.10	0.37-3.28	0.861
Crisis Following Spouse Death									
No	264	55.9	78	31.7	168	68.3	1.00		
Yes	194	44.1	78	40.2	116	59.8	1.45	0.98-2.15	0.065
Crisis Following Child Death									
No	342	77.7	110	32.2	232	67.8	1.00		
Yes	98	22.3	46	46.9	52	53.1	1.87	1.18-2.95	0.007

\*Test significant at 95% confidence interval by chi-square test, p-value &lt; 0.05

**Table 4.9** Percentage and crude odds ratio for demographic characteristics with dementia by unconditional logistic regression analysis (cont.)

Factor	Total		Dementia				Odds ratio	95%CI	p-value*
	n	%	yes		no				
			n	%	n	%			
Parental separation (n=436)									
No	422	96.8	148	35.1	274	64.9	1.00		
Yes	14	3.2	4	28.6	10	71.4	0.74	0.23-2.40	0.617
Leisure Activities									
<i>Participating in elderly club</i>									
Always	144	32.7	38	26.4	106	73.6	1.00		
Sometime	146	33.2	42	28.8	104	71.2	1.13	0.67-1.89	0.651
Never	150	34.1	76	50.7	74	49.3	2.87	1.76-4.68	<0.001
<i>Visiting neighborhood</i>									
Always	332	75.4	95	28.6	237	71.4	1.00		
Sometime	72	16.4	33	45.8	39	54.2	2.11	1.25-3.56	0.005
Never	36	8.2	28	77.8	8	22.2	8.73	3.84-19.85	<0.001
Leisure Activities									
<i>Participating in village traditions</i>									
Always	340	77.3	95	27.9	245	72.1	1.00	1.25-3.82	0.006
Sometime	61	13.9	28	45.9	33	54.1	2.19	5.76-34.94	<0.001
Never	39	8.9	33	84.6	6	15.4	14.18		
<i>Religious activities</i>									
Always	246	55.9	72	29.3	174	70.7	1.00		
Sometime	160	36.4	56	35.0	104	65.0	1.30	0.85-1.99	0.225
Never	34	7.7	28	82.4	6	17.6	11.28	4.48-28.40	<0.001

\*Test significant at 95% confidence interval by chi-square test, p-value < 0.05

Family factors consisted of 3 items include family member had history of dementia, living arrangement, caregiver. (Table 4.10)

Family factors, it was found that the every factors that significant association with dementia. It showed that elders who did not have enough caregiver support are more likely to have dementia.

It was found that elders who had family member with history of dementia are more likely to have dementia.

This study present elders who lived with other are more likely to have dementia.

**Table 4.10** Percentage and crude odds ratio for family factors with dementia by unconditional logistic regression analysis

Factor	Total		Dementia				Odds ratio	95%CI	p-value*
	n	%	yes		no				
			n	%	n	%			
Caregiver support									
Enough	370	84.1	111	30.0	259	70.0	1.00		
Not enough	70	15.9	45	64.3	25	35.7	4.20	2.46-7.19	<0.001
Family member had history of dementia (n=431)									
No	407	5.6	133	32.7	274	67.3	1.00		
Yes	24	94.4	17	70.8	7	29.2	5.00	2.02-12.36	<0.001
Living arrangement									
With spouse	178	40.5	50	28.1	128	71.9	1.00		
With other	238	54.1	95	39.9	143	60.1	1.70	1.12-2.58	0.013
Alone	24	5.5	11	45.8	13	54.2	2.17	0.91-5.16	0.081

\*Test significant at 95% confidence interval by chi-square test, p-value < 0.05

Risk factors consisted of 7 items include drinking of alcohol, smoking, physical activity, drugs usage, supplement usage, vitamin usage, food consumption and history of exposer to organic solvent. (Table 4.11)

Risk factors, it was found that the factors that significant association with dementia who were operated included drinking of alcohol, smoking, physical activity, food consumption, leisure activities and history of exposer to organic solvent.

This study presented elders who still drank alcohol are less likely to have dementia.

Elders who smoked are more likely to have dementia.

It showed that elders who had history of exposer to organic solvent are less likely to have dementia.

It showed that elders who exercised are more likely to have dementia.

It showed that elders who rarely or never did housework are more likely to have dementia

This study presented elders who ate fish in sometime are more likely to have dementia but elders who ate fat diet in sometime are less likely to have dementia.

**Table 4.11** Percentage and crude odds ratio for risk factors with dementia by unconditional logistic regression analysis

Factor	Total		Dementia				Odds ratio	95%CI	p-value*
	n	%	yes		no				
			n	%	n	%			
Drinking of alcohol									
Never	281	63.9	110	39.1	171	60.9	1.00		
Current	42	9.5	9	21.4	33	78.9	0.42	0.20-0.92	0.030
Former	117	26.6	37	31.6	80	68.4	0.72	0.46-1.14	0.157
Smoking status									
Never	184	42.7	62	33.0	126	67.0	1.00		
Current	68	15.5	34	50.0	34	50.0	2.03	1.16-3.57	0.014
Former	188	41.8	60	32.6	124	67.4	0.98	0.64-1.52	0.936
Secondhand smoke status among those with never smoking status									
Never	154	81.9	51	33.1	103	66.9	1.00		
Current	30	16.0	10	33.3	20	66.7	1.01	0.44-2.32	0.982
Former	4	2.1	1	25.0	3	75.0	0.68	0.07-6.63	0.743
History of exposer to organic solvent									
No	273	62.0	112	41.0	161	59.0	1.00		
Yes	167	38.0	44	26.3	123	73.7	0.51	0.34-0.78	0.002
Physical activities									
<i>Exercise</i>									
Always	108	24.5	28	25.9	80	74.1	1.00		
Sometime	147	33.4	36	24.5	111	75.5	0.92	0.52-1.64	0.794
Rarely/ Never	185	42.0	92	49.7	93	50.3	2.83	1.69-4.74	<0.001

\*Test significant at 95% confidence interval by chi-square test, p-value < 0.05

**Table 4.11** Percentage and crude odds ratio for risk factors with dementia by unconditional logistic regression analysis (cont.)

Factor	Total		Dementia				Odds ratio	95%CI	p-value*
	n	%	yes		no				
			n	%	n	%			
<i>Doing housework</i>									
Always	101	23.0	35	34.7	66	65.3	1.00		
Sometime	220	50.0	64	29.1	185	70.9	0.77	0.47-1.28	0.317
Rarely/ Never	119	27.0	57	47.9	33	52.1	1.73	1.01-2.99	0.048
<i>Walk</i>									
Always	44	10	11	25.0	33	75.0	1.00		
Sometime	128	29.1	38	29.7	90	70.3	1.27	0.58-2.76	0.553
Rarely/ Never	268	60.9	107	39.9	161	60.1	1.99	0.97-4.12	0.062
Food consumption									
<i>Fat intake</i>									
Rarely/ Never	65	14.8	33	50.8	32	49.2	1.00		
Sometime	319	72.5	108	34.0	211	66.1	0.50	0.29-0.86	0.011
Always	56	12.7	15	26.8	41	73.2	0.36	0.17-0.76	0.008
<i>Fiber intake</i>									
Always	226	51.4	79	35.0	147	65.0	1.00		
Sometime	205	46.6	75	36.6	130	63.4	1.08	0.73-1.61	0.696
Rarely/ Never	9	2.0	2	22.2	7	77.8	0.53	0.11-2.62	0.438
<i>Dessert intake</i>									
Rarely/ Never	369	83.9	127	34.4	242	65.6	1.00	0.71-2.21	0.446
Sometime	58	13.2	23	39.7	35	60.3	1.25	0.54-4.96	0.391
Always	13	3.0	6	46.2	7	53.8	1.63		
<i>Fish intake</i>									
Always	78	17.7	20	25.6	58	74.4	1.00		
Sometime	235	53.4	93	39.6	142	60.4	1.90	1.07-3.46	0.028
Rarely/ Never	127	28.9	43	33.9	84	66.1	1.49	0.79-2.78	0.217
Non-steroidal anti-inflammatory drug usage									
Always	11	2.5	3	27.3	8	72.7	1.00	0.43-7.80	0.408
Sometime	49	11.1	20	40.8	29	59.2	1.84	0.38-5.50	0.598
Rarely/ Never	380	86.4	133	35.0	247	65.0	1.44		

\*Test significant at 95% confidence interval by chi-square test, p-value &lt; 0.05

**Table 4.11** Percentage and crude odds ratio for risk factors with dementia by unconditional logistic regression analysis (cont.)

Factor	Total		Dementia				Odds ratio	95%CI	p-value*
	n	%	yes		no				
			n	%	n	%			
Supplement usage									
Always	16	3.6	5	31.3	11	68.8	1.00		
Sometime	28	6.4	8	28.6	20	71.4	0.88	0.23-3.35	0.851
Rarely/Never	396	90.0	143	36.1	253	63.9	1.24	0.42-3.65	0.686
Vitamins usage									
Always	66	15.0	26	39.4	40	60.6	1.00		
Sometime	60	13.6	24	40.0	36	60.0	1.03	0.50-2.10	0.945
Rarely/Never	314	71.4	106	33.8	208	66.2	0.79	0.46-1.36	0.392

\*Test significant at 95% confidence interval by chi-square test, p-value < 0.05

Clinical factors consisted of 5 items include hypertension, diabetes mellitus, dyslipidemia, body mass index, history of depression and history of head injury. (Table 4.12)

Clinical factors, it was found that the BMI factors that significant associated with dementia.

It showed that elders who having diabetes mellitus are less likely to have dementia.

This study presented elders who had lower BMI ( $<18.5 \text{ kg/m}^2$ ) are more likely to have dementia.

Other risk factors did not significant associated with dementia in elders included hypertension, dyslipidemia, checkup and history of head injury.

**Table 4.12** Percentage and crude odds ratio for clinical factors with dementia by unconditional logistic regression analysis

Factor	Total		Dementia				Odds ratio	95%CI	p-value*
	n	%	yes		no				
			n	%	n	%			
Hypertension (n= 435)									
No	229	52.0	86	37.6	143	62.4	1.00		
Yes	206	46.8	67	32.5	139	67.5	0.80	0.54-1.19	0.273
Diabetes mellitus (n=437)									
No	364	83.3	139	38.2	225	61.8	1.00		
Yes	73	16.7	17	23.3	56	76.7	0.53	0.28-0.90	0.021
Dyslipidemia (n=435)									
No	335	77.0	125	37.3	210	62.7	1.00		
Yes	100	23.0	30	30.0	70	70.0	1.38	0.86-2.25	0.181
BMI									
18.5-23.9	210	47.72	67	31.9	143	68.1	1.00		
<18.5	124	8.2	62	50.0	62	50.0	2.13	1.35-3.37	0.001
24-26.9	76	17.3	21	27.6	55	72.4	0.83	0.46-1.49	0.530
>27	30	6.8	6	20.0	24	80.0	0.51	0.20-1.31	0.162
History of head injury									
No	385	87.7	131	34.0	254	66.0	1.00		
Yes	55	12.3	25	45.5	30	54.5	1.62	0.91-2.86	0.100
Severity of Head injury (n=55)									
Mild	31	56.3	14	45.2	17	54.8	1.00		
Moderate	14	25.5	6	42.9	8	57.1	0.91	0.26-3.25	0.886
Severe	10	18.2	5	50	5	50	1.21	0.29-5.06	0.790

\*Test significant at 95% confidence interval by chi-square test, p-value < 0.05

### Multivariate analysis by multiple logistic regressions

After put all those factor that significant associated when tested by univariate analysis, it was found that age, education level, daily activity level, participating in village traditions, family member had history of dementia and having diabetes mellitus were associated with dementia.

After multiple logistic regression analysis and controlling potential confounding factor, It showed that the factors still significant associated with dementia

consisted of age ( $OR_{adj}=2.46$ , 95%CI 1.09-5.54), education level ( $OR_{adj}=2.24$ , 95%CI 1.23-4.09), daily activity level ( $OR_{adj}=5.83$ , 95%CI 1.42-24.02), participating in village traditions ( $OR_{adj}=3.89$ , 95%CI 1.02-14.90), having a family member had history of dementia ( $OR_{adj}=7.04$ , 95%CI 2.14-23.13) and having diabetes mellitus ( $OR_{adj}=0.42$ , 95%CI 0.18-0.94). (Table 4.13)

### Multivariate analysis by multiple logistic regressions

**Table 4.13** Crude odds ratio and adjusted odds ratio by logistic regression analysis (n = 440)

Factors	Crude		Adjusted		p-value*
	OR	95%CI	OR	95%CI	
Age (year)					
61-70	1.00		1.00		
71-80	2.36	1.37-4.06	1.29	0.63-2.65	0.490
Higher than 80	5.61	3.17-9.92	2.46	1.09-5.54	0.030
Education level					
Primary school	1.00		1.00		
No education	3.22	2.11-4.93	2.24	1.23-4.09	0.009
Higher than secondary school	0.58	0.21-1.59	1.76	0.50-6.21	0.382
Daily activity level					
Excellence	1.00		1.00		
Good	2.21	1.41-3.47	1.13	0.61-2.11	0.693
Fair/Poor	16.48	6.75-40.27	5.83	1.42-24.02	0.015
Participating in village traditions					
Always	1.00		1.00		
Sometime	2.19	1.25-3.82	1.27	0.54-2.96	0.584
Never	14.18	5.76-34.94	3.89	1.02-14.90	0.047
Family member had history of dementia					
No	1.00		1.00		
Yes	5.00	2.03-12.36	7.90	2.30-27.11	0.001

**Table 4.13** Crude odds ratio and adjusted odds ratio by logistic regression analysis (n = 440) (cont.)

Factors	Crude		Adjusted		p-value*
	OR	95%CI	OR	95%CI	
Diabetes mellitus (n=437)					
No	1.00		1.00		
Yes	0.56	0.34-0.93	0.42	0.18-0.94	0.035

Variable(s) in model: age, marital status, education level, income, work after 60 year old, daily activity level, crisis following child death, caregiver, participating in elderly club, visiting neighborhood, participating in village traditions, religious activities, family member had history of dementia, living arrangement, alcohol consumption, smoke, exercise, doing housework, fat intake, fish intake, history of exposure to organic solvent, having diabetes mellitus, BMI, job characteristic (before 60 years old), crisis following spouse death and walk. Multiple logistic regression analysis revealed 6 were statistically related with dementia following; age > 80 years old, no education, fair/poor daily activity level, having a family member with a history of dementia, never participating in village traditions and having diabetes mellitus.

**Relationship between factors and dementia after control other variable showed result as followed:**

**For demographic characteristics of elders,** it showed that the factors that significant associated with dementia in elders included age and occupation (after 60 years old) ( $p < 0.05$ )

It presented the elders who were aged higher than 80 years old are more likely to have dementia than who were age ranged from 61-70 years old ( $OR_{adj} = 2.93$ , 95% CI 1.21-7.11).

It was found that elders who did not study are more likely to develop dementia than who had education level were primary school ( $OR_{adj} = 2.24$ , 95% CI 1.23-4.09).

This study found that elders who had daily activity level were fair or poor are more likely to develop dementia than who had daily activity level were excellence ( $OR_{adj} = 5.83$ , 95% CI 1.42-24.02).

It showed that the factors that significant associated with dementia in elders included leisure activities ( $p < 0.05$ ). It found that elders who did not attend participating in village traditions are more likely to develop dementia than elders who had participating in village traditions ( $OR_{adj} = 3.89$ , 95% CI 1.02-14.90).

Other demographic characteristics did not significant associated with dementia in elderly people consisted of marital status, occupational (after 60 years old, income and life event.

**For family factors of elders**, it showed that the factors that significant associated with dementia in elders included family member had history of dementia ( $p < 0.05$ ). It found that elders who had a family member with a history of dementia are more likely to develop dementia than who did not have a family member with a history of dementia ( $OR_{adj} = 7.90$ , 95% CI 2.30-27.11).

Other family factors did not significant associate with dementia in the elderly consisted of living arrangement and care giver

**For risk factors of elderly people**, risk factors did not significant associated with dementia in elders consist of alcohol consumption, smoking, physical activity, food consumption and history of exposure to organic solvents usage.

**For clinical factors of elderly people**, it showed that the factors that significant associated with dementia in elderly people included body mass index and having diabetes mellitus ( $p < 0.05$ ).

It found that the elderly who having diabetes mellitus are less likely to develop dementia than elders who having diabetes mellitus ( $OR_{adj} = 0.42$ , 95% CI 0.18-0.94).

Other clinical factors did not significant associated with dementia in elders consisted of hypertension, dyslipidemia, history of depression, BMI and history of head injury.