

MINISTRY OF EDUCATION AND TRAINING

MINISTRY OF HEALTH

**NATIONAL INSTITUTE OF MALARIOLOGY,  
PARASITOLOGY AND ENTOMOLOGY**

**STUDY ON SOME EPIDEMIOLOGICAL  
CHARACTERISTICS OF DEMENTIA IN THE ELDERLY IN  
NGHE AN PROVINCE AND TREATMENT RESULTS (2022-  
2023)**

**Major: Epidemiology**

**Code: 9 72 01 17**

**THESIS SUMMARY**

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**The thesis can be found at:**

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## LIST OF ABBREVIATIONS

Abbreviations	English
AD	Alzheimer's Disease
ADL	Activities Daily living
BMI	Body Mass Index
COMIT	Community Intervention Trial
DSM	Diagnostic and Statistical Manual of Mental Disorders
EGb 761	ginkgo biloba 761
EGBs	ginkgo biloba
IADL	Instruments Activities Daily Living
MCI	Mild Cognitive Impairment
MMSE	Mini-Mental State Examination
MoCA	Montreal Cognitive Assessment
NPI	Neuro Psychiatric Inventory
WHO	World Health Organization

## INTRODUCTION

According to forecasts, by 2050, the world population aged 60 and over is expected to reach a total of 2 billion people [1].

In Vietnam, over the past 30 years, the number of elderly people has increased rapidly (4.6 million in 1989; 6.2 million in 1999; 9.1 million in 2009 [3]; 11.41 million in 2019), the proportion of elderly people in the population has also increased by 7.10%; 8.12%; 8.95% and 11.86% respectively [4].

However, in Vietnam, up to now, there have been only a few studies on dementia in the elderly in the community, these studies mainly focus on clinical research, there is extremely little data on the epidemiology of dementia in the elderly. Ginkgo biloba has been evaluated by a number of studies worldwide for its effectiveness in supporting the treatment of dementia and has also been included in the Ministry of Health's guidelines for the diagnosis and treatment of dementia [5]. Nghe An has so far had no research on the epidemiology of dementia and Vietnam has so far had no research on the effectiveness of ginkgo biloba in the treatment of dementia.

For the above reasons and with the urgency of the issue of researching dementia interventions, we conducted the research topic: *"Research on some epidemiological characteristics of dementia in the elderly in Nghe An province and treatment results (2022-2023)"* with the following objectives:

***1. Describe the incidence prevalent, distribution of incidence rate and factors associated to dementia in the elderly in Nghe An province (2022-2023).***

***2. Evaluation of the results of dementia treatment interventions using non-pharmacological measures combined with the use of ginkgo biloba.***

## **THESIS STRUCTURE**

The thesis consists of 125 pages divided into the following sections: Introduction (2 pages); literature review (34 pages); study subjects and methods (20 pages); study results (26 pages); Discussions (33 pages); Conclusions (2 pages); and Recommendations (1 page). There are 5 figures, 34 tables of research results. There are 138 references, of which 66 are from the last 5 years.

## **NOVELTY AND SCIENTIFIC AND PRACTICAL SIGNIFICANCE OF THE THESIS**

This is a study has been conducted in the community with a large sample size (2202 elderly people), with research designs and standard techniques which was widely applied in Vietnam and in the world: cross-sectional descriptive research with analysis, non-controlled treatment intervention research, pre-post follow-up; strict criteria for selecting and screening research subjects. The methods of data entry and analysis was suitable for each research variable, so the data of the thesis was highly reliable, ensuring scientific quality.

In Vietnam, there has been currently only a few research projects on the epidemiology of dementia in the elderly in the community, these projects mainly focus on clinical research. Nghe An has not yet done research on the epidemiology of dementia. Vietnam has not yet had any research on the effectiveness of ginkgo biloba in the treatment of dementia.

The results of the project have described the facts of the epidemiology of dementia in Nghe An province: characteristics of incidence, distribution of incidence and analysis of factors associated to dementia in the elderly. From there, it helps to propose intervention and prevention solutions to reduce the incidence of the disease.

The project evaluates the results of treatment interventions using non-drug measures combined with the use of ginkgo biloba, the research results of the project can be easily applied widely in the community.

The references for the study are mostly updated with more than 47,8% of the references within the past 5 years.

For the above reasons, the project ensures scientific, new and practical significance.

### **Chapter 1**

#### **LITERATURE REVIEW**

According to the definition of the World Health Organization [8]: “Dementia is a term that includes a number of diseases, mostly progressive, that affect memory, cognition, abilities and behavior, causing significant impairment in the ability to maintain activities of daily lives. Alzheimer's disease is the most common type of dementia, occurring in 60-70% of cases. Other types of dementia include vascular dementia, dementia with Lewy form and a group of diseases that contribute to frontotemporal dementia. The boundaries between different forms of dementia was often unclear and mixed types of dementia often exist”.

In 2021, the World Alzheimer's Association indicated that there was currently more than 55 million people living with dementia worldwide. This is an astonishing number, increasing every day and could reach 78 million by 2030 [14].

According to European data, if the age group of 60 - 64 years old has a dementia prevalent of 1.0%, then in the age group of 65 - 69 years old this prevalent is 2.0%, the age group of 70-74 years old is 4.0%, the age group of 75 - 79 years old is 8.0%, the age group of 80-84 years old is 16.0%.

Author Weiban in 2022 in a large-scale meta-analysis study worldwide in community samples. The results showed that the dementia prevalent in 66 studies and more than 240,000 community residents was 10.03%.

The first National Dementia Conference of Vietnam in Hanoi. The report at the conference pointed out that: In 2015, it was estimated that there were about 660,000 people

with dementia in Vietnam and this number is expected to increase to 1.2 million people by 2030 [19].

Nguyen Ngoc Hoa's study on 5,712 elderly people in 8 communes of Ba Vi district, Ha Tay province from October 2005 to October 2006 reported a prevalent of dementia of 4.6%.

According to Le Van Tuan (2014) in Hanoi, the prevalent of dementia was 4.24%.

According to Vo Van Thang et al. (2015) in Hue, the estimated prevalent of dementia was 9.4% (12% in women and 4.7% in men). This prevalent ranges from 0.5% in people aged 65–69 years to 37.7% in people aged 90 years and older [22].

\* Status of research on ginkgo biloba in the treatment of dementia:

Ginkgo biloba is a ginkgo biloba extract (GBE) that is widely used for various disorders, including cognitive dysfunction, headache, tinnitus, dizziness, inattention, mood disorders, cardiovascular disease, and coronary heart disease (DeFeudis and Drieu, 2000) [65].

Ginkgo biloba has been widely used in the treatment of dementia for decades. Several systematic reviews have been conducted to evaluate ginkgo biloba in the prevention and treatment of MCI and dementia [67], [68].

Although the Ministry of Health's protocol prescribes the use of ginkgo biloba for dementia, up to now, in Vietnam, there are no studies on the effectiveness of ginkgo biloba and no studies on dosage and duration of use in the treatment of dementia in the elderly.

## **Chapter 2:**

### **STUDY SUBJECTS AND METHODS**

#### **2.1. Subjects, location, and duration of the study**

##### **2.1.1. Subjects of the study**

Objective 1: Elderly people aged 60 years and older living in Nghe An province, selected for the study according to the following criteria:

Selection criteria: elderly people aged 60 years and older, with permanent residence and living in the research area for more than 6 months, regardless of gender, voluntarily participating and cooperating in the study, with an educational level of reading and writing or higher. Exclusion criteria: seriously ill and unable to participate in the study, unable to read or write, not volunteering and not cooperating with the study, not having a permanent residence and not living regularly in the study area.

Objective 2: All people aged 60 and over were diagnosed with cognitive impairment using the MMSE scale with a cut-off score of 23/24 in a cross-sectional survey, and at the same time met the diagnostic criteria according to DSM 5.

Exclusion criteria: People who did not agree to participate in the study and were using drugs to treat dementia.

##### **2.1.2 Study location**

The selected sites for the study included 06 communes in 3 districts of Nghe An province, representing 3 ecological regions of the province, including: Son Hai commune, Quynh Dien commune in the coastal plain of Quynh Luu district; Tay Hieu, Nghia Thuan commune in the midland area of Thai Hoa town; 2 communes Tan Lac, Chau Hanh in the mountainous area of Quy Chau district.

**2.1.3. Time of study:** 2 years, 2022 - 2023

#### **2.2 Study methods.**

##### **2.2.1. Study design.**

For objective 1: Conduct a cross-sectional descriptive study with analysis

For objective 2: Study of community treatment intervention, no-control, before-after comparison

##### **2.2.2. Sample size**

\* *Sample size for objective 1*

We applied the formula for calculating minimum sample size for descriptive study: [74]

$$n = \frac{Z_{1-\alpha/2}^2 p(1-p)}{d^2} \times DE$$

In which:

n: Minimum sample size,

p: Is the estimated proportion of patients with dementia, choose p = 0.046 for Le Van Tuan's study in Hanoi [21], 1- p = 0.954

$Z_{1-\alpha/2}$ : With a 95 percent confidence interval, the value of  $Z_{1-\alpha/2}$  is 1.96

d: Absolute error, choose d = 0.015.

DE: design coefficient, DE = 2.5 (To increase the accuracy of the sample size selected by the multi-stage sampling method).

With the selected values, sample size is 1874 people.

We expect a 10% sample loss, the minimum sample size required is 2082 people.

In fact, our sample size was 2202 people.

\* **Sample size for objective 2:**

- Research sample size: We applied the formula for calculating the sample size for a comparison study before and after, **testing two averages**

In which:

$$n = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 \times \delta^2}{(\mu_2 - \mu_1)^2}$$

n: Minimum sample size.

$Z_{1-\alpha/2}$ : Value from the normal distribution calculated on the probability of type I error, with  $\alpha = 0.05$  then  $Z_{1-\alpha/2} = 1.96$ ;

$Z_{1-\beta}$  is the value from the normal distribution calculated on the statistical power, with  $\beta = 0.05$  statistical power  $1-\beta = 95\%$  then  $Z_{1-\beta} = 1.645$ ;

$\mu_1$ : The mean score (MMSE) before intervention is 20.94;  $\mu_2$ : The mean score (MMSE) after intervention is 21.67;  $\mu_2 - \mu_1 = 0.73$ ;  $\delta$  is the standard deviation,  $\delta = 1.94$  (study using ginkgo biloba to treat dementia by José in Spain) [75].

Calculated n = 92.

We expected a 10% sample loss, the minimum sample size needed was 103 people.

In fact, the study selected 125 people.

### 2.2.3. Content and index variables in the study

#### 2.2.3.1 Research content

- **Objective 1: Describe the incidence, distribution of incidence and factors associated with dementia in the elderly in Nghe An province (2022-2023).**

+ Study to determine the overall prevalence of dementia, prevalence of dementia by gender, by educational level, prevalence of dementia by age group...

+ Study to determine factors associated with dementia

- **Objective 2: Evaluate the results of dementia treatment interventions using non-pharmacological measures combined with the use of ginkgo biloba**

Community treatment intervention study, non-controlled, before-after comparison. Evaluate intervention results after 3 months, 6 months. Follow-up and re-evaluation after 1 year.

#### 2.2.3.2. Research variables, indicators

\* **Research variables**

Table 2 1. Research variables

Name	Definition	Type	Method
Age	According to the Gregorian calendar, from the current month and year minus the month and year of birth	Continuous	Interview
High blood	Hypertension when: Systolic blood pressure $\geq 140$	Binary	Measure

<b>Name</b>	<b>Definition</b>	<b>Type</b>	<b>Method</b>
pressure	mm Hg, diastolic $\geq$ 90 mm Hg [76]		blood pressure
Diabetes	Glucose $>$ 200 mg /dL at any time, or $>$ 126 mg/dL when hungry [78]	Binary	Tests results
Sleep disorders	Sleep disorder is an inability to satisfy either the quantity or quality of sleep, persisting for a significant period of time, including difficulty falling asleep, difficulty maintaining sleep, or Early awakening, is one of the main complaints of patients and is perceived as a pathological condition [80]. No sleep disorders: satisfied in both quantity and quality of sleep.	Binary	Interview
Smoking	According to the standards of the COMMIT (Community Intervention Trial) study [81], divided into two groups: Non-smokers: Patients who have never smoked cigarettes or have smoked but have stopped smoking for at least the last 5 years. considered a non-smoker; Regular smoker: Patients who are currently smokers and have smoked at least 100 cigarettes or more are considered smokers.	Binary	Interview
Improper diet	Improper diet is a diet (or nutritional regimen) that does not ensure the following factors: Does not ensure the main principles of reasonable nutrition regarding: Energy needs and nutrient needs nutrition; Not ensuring the reasonableness of meal times and intervals: No breakfast, the interval between meals exceeds 4.5 hours A reasonable diet is a diet that ensures reasonable: Energy needs and nutrient needs;; Ensure reasonable timing and spacing of meal eating inappropriately[82]	Binary	Interview, observe
Physical activity	- Physically active group: Subjects were physically active $\geq$ 30 minutes/day or $\geq$ 150 minutes/week and did not have two consecutive days off exercise. - Inactive or sedentary group: subjects who are active $<$ 30 minutes per day or do physical exercise [83].	Binary	Interview
Entertainment activity	Participating in recreational activities means the patient participates in at least one of the following activities: One of the activities that satisfy mental needs and relieve mental stress to achieve relaxation and peace of mind. soul and higher, it is the aesthetic vibe of people. Common recreational activities include: enjoying art, playing games, religious activities, reading books, watching movies, etc. [83] Inactivity means not participating in any recreational activity.	Binary	Interview



Name	Definition	Type	Method
Social activity	<ul style="list-style-type: none"> <li>- There are social activities</li> <li>These are activities associated to social needs and individual concerns such as: participating in union work, social organizations, the masses, educational work, etc. [83].</li> <li>- No social activities: Do not participate in any activities associated to social needs, unions, social organizations, etc.</li> </ul>	Binary	Interview

## 2.2.4. Techniques, methods of information collection and means used in research

### 2.2.4.1. Techniques used in the study

\* *Community interview technique*

\* *Technique for measuring height, weight and calculating body mass index (BMI).*

\* *Techniques and methods for quantifying blood sugar:*

\* *Blood pressure measurement technique*

\* *Blood lipid measurement technique*

### 2.2.4.2. Test set used in the study

\* *Folstein Mini-Mental State Examination (MMSE)*

\* *KATZ index assessment form in assessing basic functional activities (Activities Daily Living – ADL) [84]*

Including 6 basic daily functional activities such as: bathing, dressing, toileting, moving

\* *Lawton Instrument Activities Daily Living – IADL assessment form [85]*

Including 8 important daily activities: Ability to use the phone, Shopping, Food preparation, Housekeeping, Laundry, Ways of moving (community), Responsibility for own medication, Ability to handle finances.

### 2.2.6. Data processing and analysis

The data collected in the study were processed using medical and biological statistics and SPSS 20.0 software

Use descriptive statistical parameters (frequency, proportion...) for qualitative variables of the study sample.

Use descriptive statistical parameters (Mean, media...) for quantitative variables of the study sample.

Use t-test to compare the average of 2 standard variables.

Use the Chi-square test to compare 2 proportions and examine the Association of 2 qualitative variables.

The study used the Logistic regression model and odds ratio (OR) with a 95% confidence interval to analyze factors associated with dementia

+ Multivariate analysis: is the analysis of the association of factor considering other associated in the multivariate regression equation.

### 2.2.7. Errors and error elimination

To reduce errors, we do the following:

- Have clear and accurate sample selection criteria,...

- Comply with sample screening standards, divide batches according to confounding factors.

- Increase the study sample size.

- All subjects are randomly selected into the study sample and meet the criteria, voluntarily participate in the study...

- Strictly follow the sample collection process, only test qualified samples. Strictly follow the treatment intervention measures.

### 2.2.8. Ethics in research.

- The study is approved by the Proposal Approval Council and the Ethics Council of the Central Institute of Malaria-Parasitology-Entomology.
- The study is approved by the local authorities and health care.
- Subjects who was found to have the disease was counseled and guided on examination, treatment and disease prevention according to regulations.
- The research results was feedbaced to patients.
- Strictly comply with regulations in medical and biological research such as: before the research, the research subjects must be informed and clearly stated the purpose of the research. Only research on volunteers. Keep the health status of research participants confidential.

### Chapter 3 STUDY RESULTS

#### 3.1.Prevalent of dementia and some associated factors in people over 60 years old in Nghe An (2022-2023)

During the two-year period from 2022 - 2023, the research topic studied 2,202 elderly people in Nghe An province, the results was as follows:

##### 3.1.1. General characteristics of the research subjects (2022 -2023)

+ *Age and gender of the research subjects*

Table 3. 1. Age of the research subjects

Age groups	Male		Female		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
60-64	204	27,1	437	30,2	641	29,1
65-69	217	28,8	350	24,2	567	25,7
70-74	165	19,3	304	22,4	469	21,3
75-79	86	11,4	179	12,4	265	12,0
80-84	44	5,8	97	6,7	141	6,4
85-89	37	4,9	40	2,8	77	3,5
90-102	20	2,7	22	1,5	42	1,9
Total	<b>906</b>	<b>100</b>	<b>1269</b>	<b>100</b>	<b>2202</b>	<b>100,0</b>
Average age	<b>69,7 ± 7,38</b>		<b>69,6 ± 7,35</b>		<b>69,7 ± 7,36</b>	

The age group 60-64 years old accounts for 29.1%, 65-69 years old accounts for 25.7%, 70-74 years old accounts for 21.3%, 75-79 years old accounts for 12.0%, 80-84 years old accounts for 6.4%, 85-89 years old accounts for 3.5%, 90 years old and above accounts for 1.9%.

The average age of the study population is: 69.7 ± 7.36; The average age of men is 69.7 ± 7.38, women is 69.9 ± 7.35.

+ Gender of study subjects

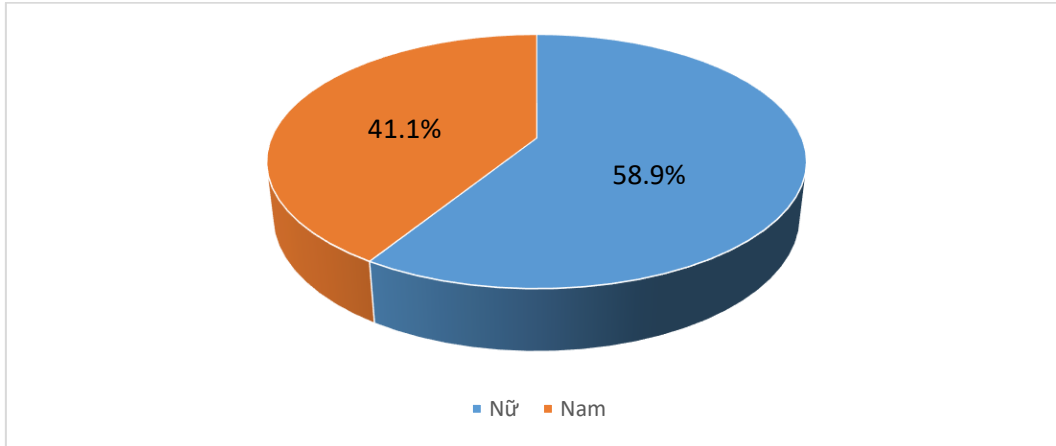


Figure 3.1 Gender of study subjects

In the study population, the proportion of elderly women accounts for 58.9% and men account for 41.1%.

+ Education level of the study subjects

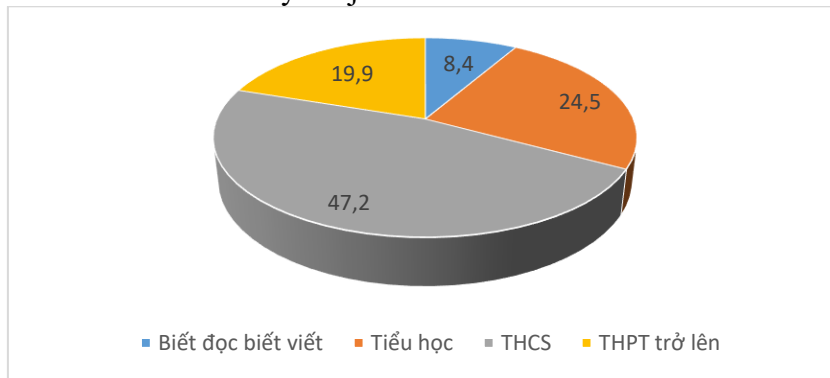


Figure 3.2 Education level of the study subjects

The proportion of elderly people with education level of Reading and writing is 8.4%; Primary school is 24.5%; Secondary school is 47.2%; High school or higher is 19.9%.

**3.1.2. Description of incidence prevalent, distribution of incidence prevalent and factors associated to dementia in the elderly in Nghe An province (2022-2023).**

**3.1.2.1. Description of the incidence and distribution of dementia in the elderly in Nghe An province**

*- Dementia incidence*

Table 3. 2. Current incidence of dementia

Research object	Total	
	Number	Percentage
Dementia	134	6,1
No dementia	2068	93,9
Total	2202	100

The incidence of dementia in the elderly in Nghe An province in 2023 is 6.1%;

- Prevalent of dementia by educational level

Table 3. 3. Prevalent of dementia by educational level

Level of education	Number of interviewees	Number of people suffering from dementia	
		Number	Percentage
Literacy	185	24	13,0
Primary	539	52	9,6
Junior high school	1039	51	4,9
High school and over	439	7	1,6
<b>Total</b>	<b>2202</b>	<b>134</b>	<b>100</b>

The prevalent of dementia increased gradually from the group with high education level of high school and above at 1.6% to the group with junior high school level at 4.9%, the group with primary school level at 9.6% and the highest prevalent of dementia was in the group with literacy level at 13%. The change was statistically significant between the groups with  $p < 0.001$ .

- Dementia incidence by age group:

Table 3. 4. Dementia incidence by age group

Age group	No	Dementia	
		Number	Proportion
60-64	641	16	2,5
65-69	567	25	4,4
70- 74	469	27	5,8
75-79	263	20	7,6
80-84	141	22	15,6
85-89	83	14	16,9
≥ 90-102	38	10	26,3
<b>Total</b>	<b>2202</b>	<b>134</b>	<b>6,1</b>

The dementia incidence increases gradually by age group, the lowest in the group of patients aged 60-64 is 2.5% and increases gradually to the group of patients aged 80-84 is 15.6% and highest in the group ≥ 90-102 years old at 26.3%. The difference is statistically significant ( $p < 0.001$ )

- *Dementia incidence by gender:*

Table 3. 5. Dementia incidence by gender

Gender	No	Dementia		p
		Number	Proportion	
Male (1)	906	56	6,2	>0,05
Female (2)	1296	78	6,0	
Total	2202	134	6,1	

There is no statistically significant difference in dementia incidence between men and women (6.2% vs. 6.0%,  $p > 0.05$ ).

### 3.1.2.2. Factors associated with dementia in the elderly in Nghe An province

- *Association between diabetes and dementia:*

Table 3. 6. Association between diabetes and dementia

Diabetes	Dementia condition		Total	OR, 95%CI, p
	Dementia	No dementia		
Having diabetes	23	221	244	1,732 (1, 082 – 2,771), 0,032
No diabetes	111	1847	1958	
Total	134	2068	2202	

People with diabetes was associated with dementia with OR= 1.732, 95% CI: 1.082 – 2.771, with  $p < 0.05$ .

- *Association between hypertension and dementia*

Table 3. 7 Association between hypertension and dementia

Hypertension	Dementia condition		Total	OR, 95%CI, p
	Dementia	No dementia		
Yes	84	855	939	2,381 (1,66 -3,42), < 0,001
No	50	1213	1263	
Total	134	2068	2202	

Elderly people with hypertension was associated with higher dementia than those without hypertension with OR= 2.381 (95%CI: 1.66-3.42),  $p < 0.01$ .

- *Association between education level and dementia*

Table 3. 8 Association between education level and dementia

Education level	Dementia condition		Total	OR, 95%CI,p
	Dementia	No dementia		
Junior high school	127	1651	1778	4,533 (2,11 - 9,776) < 0,001
High school and above	7	417	424	
Total	134	2068	2202	

There is an association between secondary school education or below and dementia, with OR = 4.533 (95% CI: 2.11 - 9.776),  $p < 0.001$ .

- Association between leisure activities and dementia

Table 3. 9 Association between leisure activities and dementia

Leisure activities	Dementia condition		total	OR, 95%CI, p
	Dementia	No dementia		
No	49	282	408	3,694 (2,542-5,370), < 0,001
Yes	85	1786	1794	
Total	134	2068	2202	

There is an association between not participating in leisure activities in the elderly and having dementia, with OR= 3.694 (95% CI: 2.542-5.370),  $p < 0.001$ .

- Association between physical activity and dementia

Table 3. 10 Association between physical activity and dementia

Physical activity	Dementia condition		Total	OR, 95%CI, p
	Having dementia	No dementia		
No	61	448	509	3,064 (2,144-4,377), < 0,001
Yes	73	1620	1693	
Total	134	2068	2202	

There is an association between not participating in physical activity in the elderly and having dementia, with OR= 3.064 (95% CI: 2.144 – 4.377),  $p < 0.001$ .

- Association between smoking and dementia

Table 3. 11 Association between smoking and dementia

Smoking	Dementia condition		Total	OR, 95%CI, p
	Having dementia	No dementia		
Yes	21	194	215	1,795 (1,101-2,926), 0,017
No	113	1874	1987	
Tổng	134	2068	2202	

Smoking is associated with dementia OR= 1.795 (95% CI: 1.101 – 2.926). The difference is statistically significant ( $p < 0.05$ ).

- Association between sleep disorders and dementia

Table 3. 12 Association between sleep disorders and dementia

Sleep disorders	Dementia condition		Total	OR, 95%CI, p
	Having dementia	No dementia		
Yes	94	1085	1179	2,129 (1,456 - 3,113), < 0,001
No	40	983	1023	
Total	134	2068	2202	

There is an association between sleep disorders in the elderly and dementia, with OR= 2.129 (95% CI:1.456 - 3.113),  $p < 0.001$ .

- Multivariate logistic regression model identifies factors associated with dementia

Table 3. 13. Multivariate logistic regression model identifies factors associated with dementia

STT	Variable	Coefficient of aggression	p	OR	95%CI
1	Education level: Junior high school	1,083	0,007	2,953	1,347-6,477
2	Hypertension	0,505	0,011	1,657	1,122-2,446
3	No leisure activities	0,712	0,001	2,038	1,315-3,157
4	No physical activity	0,545	0,011	1,725	1,134-2,625
5	Age group 75-79	1,163	0,013	3,201	1,274-8,040
	Age group 80-84	1,267	0,006	3,549	1,447-8,701
	Age group 85-89	1,586	0,001	4,885	1,988-12,003
	Age group 90-102	2,045	0,001	7,729	2,987-20,00
6	Smoking	0,721	0,007	2,057	1,217-3,476
7	Sleep disorders	0,551	0,007	1,735	1,161-2,593

The results of multivariate logistic regression analysis identified 7 factors associated to dementia in our study, which are: Education level from junior high school or below; Hypertension; Age group over 75; No leisure activities and no physical activities; Smoking; Sleep disorders.

### 3.2. Evaluation of the results of dementia treatment interventions using non-pharmacological measures combined with ginkgo biloba

#### 3.2.1. Intervention results by disease severity

Table 3.14. Intervention results by level before and after intervention (n=125)

Time \ Level	Before intervention		3 months after intervention		6 months after intervention		p
	Number	(%)	Number	(%)	Number	(%)	
<b>Normal</b>	0	0,0	50	40,0	76	60,8	p (1-0) < 0,001 p (2-0) < 0,001 p (2-1) < 0,001
<b>Mild</b>	79	63,2	50	40,0	33	26,4	p (1-0) < 0,001 p (2-0) < 0,001 p (2-1) < 0,001
<b>Moderate</b>	38	30,4	20	16,0	14	11,2	p (1-0) < 0,001 p (2-0) < 0,001 p (2-1) < 0,001
<b>Severe</b>	8	6,4	5	4,0	2	1,6	p (1-0) < 0,05 p (2-0) < 0,05 p (2-1) < 0,05

The number of normal patients before intervention was 0, the number of patients after 3 months of intervention was 50 (40%) and after 6 months was 76 (60.8%).

### 3.2.2 Intervention effectiveness assessed by MMSE score

- Average MMSE score before and after intervention

Table 3.15. Mean MMSE scores before and after intervention (n=125)

Time MMSE point	Before intervention (0)		3 months after intervention (1)		6 months after intervention (2)		p
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	
Average	19,6	3,67	21,8	3,79	23,3	3,29	p(1-0) < 0,001 p(2-0) < 0,001
Mild	21,8	1,09	23,9	1,84	24,9	1,73	p(1-0) < 0,001 p(2-0) < 0,001
Moderate	17,3	1,77	19,7	2,50	21,6	2,84	p(1-0) < 0,001 p(2-0) < 0,001
Severe	10,4	1,84	13,1	1,97	16,6	2,67	p(1-0) < 0,001 p(2-0) < 0,001

The average MMSE score before intervention was  $19.6 \pm 3.67$ , after 3 months of intervention it was  $21.8 \pm 3.79$ , the MMSE score improved by 2.2 points, after 6 months of intervention it was  $23.3 \pm 3.29$ , the MMSE score improved by 3.7 points. The change was statistically significant ( $p < 0.001$ ).

Table 3.16. Comparison of mean MMSE scores after 6 months and 3 months (n=125)

Time MMSE point	3 months after intervention (1)		6 months after intervention (2)		p
	$\bar{X}$	SD	$\bar{X}$	SD	
Average	21,8	3,79	23,3	3,29	p(2-1) < 0,001
Mild	23,9	1,84	24,9	1,73	p(2-1) < 0,001
Moderate	19,7	2,50	21,6	2,84	p(2-1) < 0,001
Severe	13,1	1,97	16,6	2,67	p(2-1) < 0,001

### 3.2.3. Intervention effectiveness assessed by ADL score

Table 3.17. Functional ability assessed by ADL scale before and after intervention (n=125)

Time Ability	Before intervention		3 months after intervention (1)		6 months after intervention (2)		p
	Number	(%)	Number	(%)	Number	(%)	
Independence activity	46	36,8	52	41,6	68	54,4	p(1-0) < 0,001 p(2-0) < 0,001 p(2-1) < 0,001
Partially dependent activity	79	63,2	73	58,4	57	45,6	p(1-0) < 0,001 p(2-0) < 0,001 p(2-1) < 0,001
Fully dependent activity	0	0,0	0	0,0	0	0,0	

Patients with the ability to function completely independently increased from 46 patients (36.8%) before intervention to 52 patients (41.6%) after 3 months, and 68 patients (54.4%) after 6 months with  $p < 0.001$ .



Table 3. 18. Mean ADL scores before and after intervention (n=125)

Time ADL average point	Before intervention (0)		3 months after intervention (1)		6 months after intervention (2)		p
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	
Average	4,59	1,34	4,87	1,16	5,29	0,92	p(1-0) < 0,001 p (2-0) < 0,001
Mild	5,21	1,02	5,37	0,91	5,69	0,61	p(1-0) < 0,001 p (2-0) < 0,001
Moderate	3,78	1,06	4,27	0,87	4,84	0,83	p(1-0) < 0,001 p (2-0) < 0,001
Severe	2,80	1,32	3,20	1,23	3,80	1,03	p(1-0) < 0,05 p (2-0) < 0,05

The average ADL score before intervention was  $4.59 \pm 1.34$ , after 3 months it increased to  $4.87 \pm 1.16$ , the ADL score improved by 0.28; after 6 months it increased to  $5.29 \pm 0.92$ , the ADL score improved by 0.7, the change was statistically significant ( $p < 0.05$ ).

Table 3. 19. Comparison of mean ADL scores after 6 months and 3 months (n=125)

Time ADL average point	3 months after intervention (1)		6 months after intervention (2)		p
	$\bar{X}$	SD	$\bar{X}$	SD	
Average	4,87	1,16	5,29	0,92	p(1-2) < 0,001
Mild	5,37	0,91	5,69	0,61	p(1-2) < 0,001
Moderate	4,27	0,87	4,84	0,83	p(1-2) < 0,001
Severe	3,20	1,23	3,80	1,03	p(1-2) < 0,05

### 3.2.4. Intervention results assessed by IADL scale

Table 3. 20. Mean IADL scores before and after intervention (n=125)

Time IADL average point	Before intervention (0)		3 months after intervention (1)		6 months after intervention (2)		p
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	
Average	2,38	1,52	3,13	1,75	4,16	1,74	p(1-0) < 0,001 p (2-0) < 0,001
Mild	2,41	1,61	3,11	1,81	4,18	1,68	p(1-0) < 0,001 p (2-0) < 0,001
Moderate	2,42	1,36	3,14	1,53	4,17	1,76	p(1-0) < 0,001 p (2-0) < 0,001
Severe	2,1	1,52	3,2	2,20	4,0	2,31	p(1-0) < 0,05 p (2-0) < 0,05

The average IADL score before intervention was  $2.38 \pm 1.52$ , after 3 months of intervention it increased to  $3.13 \pm 1.75$ , the improved IADL score was 0.75, after 6 months of intervention it increased to  $4.16 \pm 1.74$ , the improved IADL score was 1.78, the change was statistically significant ( $p < 0.05$ ).

Table 3.21. Comparison of mean IADL scores after 6 months 3 months (n=125)

Time IADL average point	3 months after intervention (1)		6 months after intervention (2)		p
	$\bar{X}$	SD	$\bar{X}$	SD	
Average	3,13	1,75	4,16	1,74	p(1-2) < 0,001
Mild	3,11	1,81	4,18	1,68	p(1-2) < 0,001
Moderate	3,14	1,53	4,17	1,76	p(1-2) < 0,001
Severe	3,2	2,20	4,0	2,31	p(1-2) < 0,05

## Chapter 4

### DISCUSSION

#### 4.1. General characteristics of the research subjects

- **Regarding the gender of the research subjects:** In our study, the proportion of women (58.9%) is higher than that of men (41.1%). In the study of Le Van Tuan in Hanoi, women accounts for 55.9%, men accounts for 44.1% [21]. In the study of Cao Manh Long in Ba Vi, Ha Tay (old), women accounts for 53.2%, men accounts for 46.8% [17]. When Tran Thi Thuy Ha conducted research in 3 districts of Hai Phong city, it was found that the proportion of men accounts for 39.6%, women accounted for 60.4% [58].

- **Regarding the age group of the research subjects:**

In our study: The age group of 60-64 years old accounts for 29.1%, 65-69 years old accounts for 25.7%, 70-74 years old accounts for 21.3%, 75-79 years old accounts for 12.0%, 80-84 years old accounts for 6.4%, 85-89 years old accounts for 3.5%, 90 years old and above accounts for 1.9%.

Le Van Tuan, the age group of 60-64 years old accounts for 27.1%. Our research results are quite similar to the research results on age groups of Le Van Tuan [21]. In Cao Manh Long's study, the age group of 65-69 years old accounts for the highest percentage of 32.7% [17].

- **About the average age of the research subjects:** In our study, the average age of the research subjects is  $69.7 \pm 7.36$ . In Cao Manh Long's study, the average age of the research population is  $71.1 \pm 7.0$  [17]. Nguyen Thi Thanh Huong, the average age of the research population is  $72.09 \pm 7.59$  [86]. Tran Thi Thuy Ha, the average age of the research population: male is  $70.4 \pm 7.1$ , female is  $70.7 \pm 17.8$  [58]. The average age of the studies is different according to us depending on the research area, research sample size

- **About the educational level of the research subjects**

In our study: The proportion of elderly people with education level of Literacy is 8.4%; Primary school is 24.5%; Secondary school is 47.2%; High school and above is 19.9%. Tran Thi Thuy Ha, primary school education level 25.9%, junior high school 43.6%, high school 20.4%, above high school is 10.0% [58]. Le Van Tuan, literacy education level is 18.2%, primary school is 15.5%, junior high school 19.5%, high school 12.6%, high school and above 34.2% [21]. Cao Manh Long, illiterate education level: 11.9%, primary school 18.2%, junior high school 50.0%, high school is 19.8% [17]. In our opinion, education level depends on the research area, economic and social characteristics of each region as well as the research time.

#### 4.2. Some epidemiological characteristics of dementia and associated factors in the elderly:

##### 4.2.1. Current prevalent of dementia

In our study, the prevalent of dementia in the elderly in Nghe An province in 2023 was 6.1%.

The results of our study are lower than the results of the study by Nguyen Kim Viet in 2 wards of Thai Nguyen city, which reported a prevalent of dementia of 7.8% [55] Long in Ba Vi district, Hanoi (7.2%) [17]. The study by Tran Thi Thuy Ha in Hai Phong city was 13.9% [86]. The study by Nguyen Ngoc Hoanh My Tien in Ho Chi Minh City was 7.1% [57]. However, the results of our study are higher than those of Le Van Tuan, in 2 communes of Soc Son district and 2 wards of Dong Da district, which was 4.24% [21]. The study by Nguyen Ngoc Hoa in 8 communes of Ba Vi district, Ha Tay province (old) reported a prevalent of 4.6% [20].

Our research results are quite similar to some authors in the world. Jia L. in China is 6.1% [51], Hofman A in the Netherlands [89] is 6.3%. This shows that the level of education, universal education policy, illiteracy eradication, health care capacity of the health system of Vietnam as well as the concern for the elderly in terms of material and spiritual life of the activities of associations, especially the elderly association, is quite good, this helps control factors associated to the prevalent of disease. In Vietnam, the prevalent of disease through studies has results ranging from 4-5% to above or below 10% depending on the research results. Our research results are at an average level compared to domestic and foreign authors. The increase in the prevalent of disease over time is not clear compared to previous research results. This shows that the number of dementia patients is increasing due to the high proportion of elderly people in the community along with the aging of the population over time.

#### **4.2.2. Dementia incidence by educational level**

In our study, the incidence of dementia in the elderly gradually decreased with increasing educational level. The incidence prevalent at the highest education level was literacy, accounting for 13.0%, then gradually decreased with higher education levels. The lowest prevalent was in the group with an education level of high school or higher, accounting for 1.6%. This difference is statistically significant.

Le Van Tuan found that the incidence prevalent was highest in the group with literacy (10.9%), lowest in the group with high education level (from university - college - vocational secondary school or higher) (1.8%) [21]. According to Nguyen Ngoc Hoa, the incidence prevalent of dementia decreased with increasing education level. The highest prevalent in the literate group was 9.7%, the prevalent from secondary school and above was 1.8%. The change was statistically significant with  $p < 0.001$  [20].

Jia L, assessed education level by years of education ( $< 1.1-6$  and  $> 6$  years) associated with dementia with OR from 1.17 [1.06–1.29] to 1.55 [1.38–1.73], the association was statistically significant ( $p < 0.001$ ) [51].

Our study results are consistent with the findings of domestic and foreign authors: showing a association of education level and dementia in the elderly. Elderly people with low education levels are at higher risk of dementia than those with high education levels. This finding is also consistent with domestic and foreign authors. The universal education policy with the goal of all citizens of the age group being able to study and reach a certain level of education as prescribed by law will contribute to reducing the prevalent of dementia in the elderly.

#### **4.2.3. Dementia prevalent by age group**

The results of our study show that the prevalent of dementia increases gradually with age group, the lowest in the group of patients aged 60-64 years old is 2.5% and gradually increases to the group of patients aged 80-84 years old is 15.6% and the highest in the group  $\geq 90-102$  years old is 26.3%. The difference is statistically significant ( $p < 0.001$ )

In the elderly: after 5 - 10 years of age, the rate of dementia increases 1.5 to 2 times. Our findings are consistent with Nguyen Ngoc Hoa's findings in Ba Vi district, Hanoi [20]: the age group of 60 - 64 years old is 0.8%, 65-69 years old is 1.4%, the age group of 70-74 years old is 3.8%, the age group of 75-79 years old is 5.9%, the age group of 80-84 years old is 8.5%, from 85 years old and above is 16.4%, on average after each five-year gap the prevalent of dementia increases from 1.5-2.8 times. And similar to Nguyen Kim Viet in Thai Nguyen [55].

The research results of Jia L. show that the prevalent of dementia increases with age, from 2.9% in 27,630 individuals aged 60-69 to 31.9% in 570 people aged 90 and above, with a significant increase in the prevalent with age [51].

Our research results are also consistent with the research results of domestic and foreign authors. The older the age, the higher the prevalent of dementia.

#### **4.2.4. The prevalent of dementia by gender**

In our study, the prevalent of dementia in men was 6.2% and in women was 6.0%, the difference was not statistically significant with  $p > 0.05$ .

The prevalence of dementia by gender in the research results of Cao Manh Long: men 20.7%, women 36.7%, the change was statistically significant [17]. The incidence prevalent by gender in the study results of Le Van Tuan: male 3.6%, female 4.8%, the difference is not statistically significant ( $p > 0.05$ ) [21]

However, the study results of Jia L showed that the incidence prevalent of dementia is significantly higher in women than in men with a significantly higher incidence prevalent and percentage distribution in all age groups of women OR 1.43 (1.31–1.56)  $p < 0.001$  [51].

The incidence prevalent of dementia in the elderly by gender has no difference in our study, which is also consistent with the majority of opinions of domestic and foreign authors.

#### **4.2.5. Association between dementia and comorbidities**

##### **\* Association between diabetes and dementia**

Our study results show that dementia is statistically significantly associated with diabetes ( $p < 0.05$ ).

However, in the study of Cao Manh Long [17], the proportion of patients suffering from dementia with diabetes is 28%, and there is no association between diabetes and dementia ( $p = 0.9694$ ). Le Van Tuan, the incidence of dementia in people with diabetes in previous years (3.6%) is lower than that of people without this history (4.3%). The difference is not statistically significant ( $p > 0.05$ ) [21]. Tran Thi Le Thanh [99] studied the characteristics of cognitive disorders in patients with type 2 diabetes in people over 60 years old, and also found that the risk of dementia is most clearly affected by the treatment for diabetic patients. The highest risk is for the group with high blood sugar who must use injectable insulin. Author Jingjing Song meta-analyzed five retrospective studies with 577592 diabetic patients included, and 99.0% of them had type 2 diabetes. With a mean follow-up of 6.3 years, 31963 patients were newly diagnosed with dementia. The pooled results showed that diabetic patients with higher HbA1c variability were associated with a higher risk of dementia [100].

##### **\* Association of hypertension with dementia**

Our study results showed that elderly people with hypertension were associated with a higher risk of dementia than those without hypertension with OR= 2.381 (95%CI: 1.66-3.42),  $p < 0.001$ .

Le Van Tuan, elderly people with hypertension are 3.1 times more likely to develop dementia than those without hypertension. The difference is statistically significant ( $p < 0.01$ ) [21]

However, Nguyen Ngoc Hoa [20] when researching in the suburban area of Hanoi found that hypertension was not associated to dementia.

According to Jia L., in a study of 46,011 people over 60 years old, 2,766 people had dementia; in which hypertension was identified as a risk factor with OR = 1.86 (1.70–2.03) with  $p < 0.0001$  [51].

The above authors' opinions show that the association of hypertension and dementia in the elderly still has different views. The results of our study show that there is a fairly clear association of hypertension and dementia in the elderly. In our opinion, hypertension is not a direct cause of dementia. However, complications of hypertension to target organs: heart, eyes, brain, kidney are the direct causes associated to dementia.

#### **4.2.6. Association between physical and mental activities and dementia**

##### **\* Association between leisure activities and dementia**

The results of our study show a association of not participating in leisure activities in the elderly and dementia, with OR= 3.694 (95% CI: 2.542-5.370),  $p < 0.001$ .

Tran Viet Luc's study [108] showed that regularly participating in cognitively stimulating activities such as reading newspapers, playing chess, playing cards can reduce the risk of dementia.

Author Jianwei Zhu stated: For leisure activities, visiting friends/family (HR 0.66, 95%CI: 0.56–0.77) and participating in other group activities (HR 0.91, 95%CI: 0.85–0.98) were associated with a reduced risk of dementia [114].

### **\* Association of physical activity with dementia**

Our study results found a association of not participating in physical activity in the elderly and dementia, with OR = 3.064 (95% CI: 2.144 – 4.377),  $p < 0.001$ .

Tran Viet Luc [108] stated that regularly participating in physical activity such as walking, jogging, and housework can reduce the risk of dementia due to Alzheimer's disease. Huynh Thi Thanh Tu, the prevalent of people who do not participate in physical activity with dementia is 30.6% compared to people who participate in physical activity with dementia is 13.2%. The association is statistically significant  $p < 0.05$  [105]

A systematic review analysis by author Conor Cunningham stated: Older adults ( $\geq 60$  years old) who are actively physically active reduce the risk of death from all causes and cognitive decline, dementia, Alzheimer's disease and depression, slow down the aging process, have better quality of life and improved cognitive function [115].

In general, research shows that there is a association of physical activity and dementia in the elderly. Our results show that people who are not physically active have a higher risk of dementia than people who are physically active, consistent with the findings of domestic and foreign authors that there is a association of physical activity and dementia in the elderly.

### **\* Association of sleep disorders and dementia**

Our research results: there is a association of sleep disorders in the elderly and dementia, with OR = 2.129 (95% CI: 1.456 - 3.113),  $p < 0.001$ .

Le Van Tuan, has not found a Association of disorders and dementia in the elderly. The difference is not statistically significant ( $p > 0.05$ ) [21].

Neil Mookerjee, in a retrospective cross-sectional study in the US, found that the prevalent of dementia in the group with sleep disorders was higher than in the group without sleep disorders (6.5% vs. 3.4%;  $p = 0.015$ ). However, when analyzing multivariate logistic regression, the author found no association between sleep disorders and dementia [117].

#### **4.2.7. Association of smoking with dementia**

Our study results show that smoking is associated with dementia OR= 1.795 (95% CI: 1.101 – 2.926). The difference is statistically significant ( $p < 0.05$ ).

Nguyen Ngoc Hoa, the prevalent of dementia in non-smokers is 2.9 times higher than in smokers. The difference is statistically significant  $p < 0.05$  [20].

Huynh Thi Thanh Tu, the prevalent of smokers with the disease is 22.1%, compared to 18.4% of non-smokers with the disease, the difference is not statistically significant ( $p > 0.05$ ) [105].

Jia L. in a cross-sectional study in China found that smoking is associated with dementia (OR: 1.85 [1.67 - 2.04]); cognitive impairment OR: 1.27 [1.19 - 1.36]) with  $p < 0.001$  [51].

#### **4.2.8. Multivariate logistic regression model**

Using the Multivariate Logistic Regression Model, we identified 7 factors that are actually associated to dementia: education level, hypertension, age group, not participating in recreational and physical activities, smoking, sleep disorders. Some factors such as diabetes, lipid metabolism disorders, overweight and obesity, social inactivity ... are not necessarily unrelated to dementia, but according to us at the time of the study, the associated factors were more prominent in the multivariate analysis.

Jia L. identified 12 risk factors for dementia that are specific to each specific patient. He compiled and divided them into 2 groups, group 1: Factors that cannot be changed; Group 2: Modifiable factors.

*Group 1:* There are three non-modifiable factors:

- Older age;
- Female gender;
- Parental family history.

*Group 2:* There are nine modifiable risk factors including: living in rural areas, fewer years of education, poor medical support, unhealthy diet, marital status, risk factors and

comorbidities such as smoking, high blood pressure, hyperlipidemia, heart and cerebrovascular disease are closely associated to dementia [51].

In our opinion, determining factors associated to dementia depends on the characteristics of economic, social, and intellectual life as well as the ability to provide different health care services between regions within a country and countries around the world. However, the important meaning is that when determining the factors actually associated to dementia in a locality or region, it will help to propose focused intervention solutions to eliminate associated factors right in that locality, which will contribute to reducing the incidence of dementia as well as slowing the progression in those who have already had it.

#### **4.3. Treatment intervention results.**

During the intervention and follow-up process, all patients fully complied with non-pharmacological measures and used ginkgo biloba. No patient experienced unwanted side effects of the drug. After 6 months of treatment intervention and 1 year of follow-up, although the study patients were all elderly, no patient died due to illness and age. All patients had not been diagnosed and treated for dementia before. We found that the treatment response was very good both after 3 months and after 6 months.

##### **4.3.1. Assessment of disease severity before and after intervention**

The results of our study showed that the change in disease severity improvement before and after treatment intervention was statistically significant with  $p < 0.05$

This result is similar to the study by Nguyen Bich Ngoc at the Central Geriatric Hospital, patients in the mild stage accounted for 30.8%, in the moderate cognitive impairment level was 47.5% and severe cognitive impairment was 21.7% [64]. However, this study was conducted at the Hospital, so the patients were often in the moderate and severe levels.

##### **4.3.2. Intervention results according to the MMSE minimum mental status assessment scale**

In our study, the average mental status score (MMSE) before intervention was  $19.6 \pm 3.67$ . This result is higher than the study by Pham Thang and colleagues at the Central Geriatric Hospital. The average MMSE score of Alzheimer's patients was  $16.71 \pm 6.45$  [125].

This result is also higher than the study of Nguyen Bich Ngoc at the Central Geriatric Hospital, the average mental status score (MMSE) was  $14.71 \pm 7.13$  [64].

In the study of José et al. in Spain, a retrospective study of 133 patients with MCI and dementia undergoing treatment. The average MMSE score for the group of patients using Egb 761 before intervention was  $20.94 \pm 1.94$ , after 6 months of intervention was  $21.67 \pm 2.04$ , after 12 months was  $22.78 \pm 2.08$  ( $p < 0.01$ ) [75].

In Mazza's study, 25 patients were treated with Egb 761. The mean MMSE scores ranged from  $18.80 \pm 3.622$  (SD) at baseline to  $19.40 \pm 3.485$  (SD) after 24 weeks of intervention, with an average increase of 0.6 [129]. Similar to other studies, our results showed that the MMSE scores improved significantly after 3 and 6 months of treatment. The difference in improvement between 6 and 3 months of treatment was statistically significant with  $p < 0.001$ . The improvement was definitely

Cognitive enhancement is very important to help patients improve their quality of life and prevent complications of dementia such as falls, choking, etc.

##### **4.3.3 Intervention results based on improvement according to the basic daily living activities (ADL) scale**

The results of our study showed that the average ADL score before intervention was  $4.59 \pm 1.34$ , after 3 months of intervention was  $4.87 \pm 1.16$  ADL points; after 6 months of intervention was  $5.29 \pm 0.92$  ADL points. The change was statistically significant ( $p < 0.001$ ). Comparison between 6 months and 3 months, the change is statistically significant ( $p < 0.001$ )

Author Pham Bich Ngoc, the average ADL score applying non-pharmacological measures also brought about effective improvement in basic functional activities, before intervention the average ADL score was  $4.37 \pm 1.61$ , after 6 months of intervention the average ADL score was  $4.931 \pm 1.3$  with  $p < 0.05$ , the average ADL score increased by 0.56 points [64].

Pham Thang, treated patients with dementia with galantamine at a dose of 16mg/day, the results after 6 months, the average ADL score improved from 5.09 to 6.33 ( $p < 0.05$ ) [63].

According to Ralf Ihl, when conducting a multicenter trial on 410 outpatients with mild to moderate dementia. Patients were randomized to double-blind treatment with 240 mg EGb 761 or placebo once daily for 24 weeks. The results showed a mean improvement in ADL scores of 0.2 (SD 0.29). Compared with placebo, the change was statistically significant ( $p = 0.001$ ) [13].

Kanowski et al., treated 106 outpatients with dementia with 240 mg Egb 761 daily and found a mean improvement in ADL scores of 0.8 (SD 1.9). Compared with placebo, the change was statistically significant ( $p = 0.001$ ) [135].

In fact, all 125 of our patients had not had any previous exposure to dementia diagnosis and treatment. We simultaneously applied non-pharmacological measures combined with the use of ginkgo biloba at a dose of 160 mg/day continuously for 6 months. During the follow-up evaluation, the patient responded very well to the treatment. The improvement in basic daily functioning helps the patient to be able to take care of himself without having to depend on a caregiver.

#### **4.3.4. Intervention results according to the instrumented activities of daily living (IADL) score**

The results of our study were an average IADL score before intervention of  $2.38 \pm 1.52$ , after 3 months of intervention of  $3.13 \pm 1.75$  IAD points, after 6 months of intervention of  $4.16 \pm 1.74$  IADL points, the change was statistically significant ( $p < 0.05$ ). The comparison between 6 months and 3 months of improvement was statistically significant  $p < 0.001$ .

Author Pham Bich Ngoc, used non-pharmacological intervention with exercises. The average IADL score before intervention was  $4.57 \pm 1.96$ , after 24 weeks of intervention the average IADL score was  $4.93 \pm 1.93$ , the change was statistically significant ( $p = 0.030$ ) [64].

Pham Thang, treated patients with dementia with Galantamine at a dose of 16 mg/day, after 6 months, the average IADL score improved from 5.77 to 6.54 ( $p < 0.05$ ) [63].

Olivera (2021), used non-pharmacological measures with virtual reality-based cognitive stimulation methods for 2 months, the average IADL score improved by  $0.439 \pm 0.181$  [137].

Similarly, author Liao (2020) also used the above measure, the results showed that the average IADL score improved by  $0.713 \pm 0.346$  [138].

In general, the results of our study are similar to those of domestic and international authors when applying different measures, all showing improvements in functional scores using daily tools. Improving functional activities using tools helps patients improve their quality of life and reduce pressure on caregivers

#### **CONCLUSION**

The study on 2,202 elderly people in Nghe An province allows the following conclusions to be drawn:

1. Some epidemiological characteristics of dementia in the elderly
  - The prevalent of elderly people having dementia in Nghe An province is 6.1%
  - The prevalent of dementia in men is 6.2%, in women is 6.0%.
  - The prevalent of dementia increases with age: 2.5% for 60-64 year olds, 4.4% for 65-69 year olds, 5.8% for 70-74 year olds, 7.6% for 75-79 year olds, 15.6% for 80-84 year olds, 16.9% for 85-89 year olds, and 26.3% for 90 year olds and above.
  - The prevalent of dementia in the group with low education level (literacy) is 13%, the group with primary school education is 9.6%, the group with secondary school education is 4.9%, the group with high school education or higher is 1.6%.

- Some factors associated to dementia in the elderly in Nghe An

Using a multivariate logistic regression model, 7 factors associated to dementia were identified:

+ Age over 75

+ Education level from junior high school or below

- + Hypertension
- + No leisure activities
- + No physical activity
- + Smoking
- + Sleep disorders

## 2. Evaluation of treatment results:

- Evaluation by disease severity before and after intervention:

The number of normal patients before intervention was 0, after 3 months of intervention was 50 (40%) and after 6 months was 76 (60.8%) ( $p < 0.05$ ). The number of patients with moderate level of dementia decreased from 63.2% before intervention to 40.0% after 3 months and to 26.4% after 6 months ( $p < 0.001$ ). The number of patients with moderate level of dementia decreased from 30.4% after 3 months to 16.0% after 6 months and to 11.2% after 6 months ( $p < 0.001$ ). The number of patients with severe level of dementia decreased from 6.4% to 4.0% after 3 months of intervention and to 1.6% after 6 months ( $p < 0.05$ ).

- MMSE score (Assessment of cognitive function); ADL score (Assessment of basic daily activities); IADL score (Assessment of daily activities using tools) all improved after 3 months and 6 months of treatment with statistical significance with  $p < 0.001$ . Response to treatment intervention was good in all three groups: mild, moderate and severe.

- Regarding the treatment time, the comparison between 6 months and 3 months showed that the improvement was statistically significant with  $p < 0.001$  on all three scales: MMSE, ADL, IADL.

- The comparison results before and after the intervention the change were statistically significant with  $p < 0.05$  in all age groups, education level, and gender.

- Using Ginkgo Biloba at a dose of 160mg/day was effective in the treatment of dementia. The 6-month treatment period was more effective than the 3-month treatment period.

## **RECOMMENDATIONS**

### **1. Recommendations to strengthen the detection and prevention of factors associated to the incidence of the disease.**

- Communicate and promote health to minimize risks and prevent dementia.

- Implement records to monitor, advise, and provide preventive treatment for people with high blood pressure and diabetes, increase physical activities and recreational activities at home associated with the role of caregivers and in the community, especially the role of the elderly association. Quit smoking for smokers, pay attention to treating sleep disorders.

### **2. Propose treatment interventions for people with dementia**

- Implement comprehensive and in-depth diagnosis and treatment of dementia at medical examination and treatment facilities according to technical levels. Implement nutritional prescriptions, physical exercise, psychological counseling and lifestyle changes for people with dementia; provide palliative care for patients at medical facilities and at home; provide care, rehabilitation, and social community re-adaptation for patients.

From the research results, we propose to use ginkgo biloba at a dose of 160mg/day continuously for 3 - 6 months.

## **SCIENTIFIC WORKS**

### **RELATED TO THE THESIS THAT HAVE BEEN PUBLISHED**

1. Tang Viet Ha, Cao Ba Loi, Duong Dinh Chinh (2024), Study on epidemiological characteristics of dementia in the elderly in Nghe An province 2022-2023, *Journal of Community Medicine*, No. 65(6), pp. 181-185.

2. Tang Viet Ha, Cao Ba Loi, Duong Dinh Chinh (2024), Study on factors associated to dementia in the elderly in Nghe An province (2022-2023), *Journal of Community Medicine*, No. 65(6), pp. 186-191.

3. Tang Viet Ha, Cao Ba Loi, Duong Dinh Chinh (2024), Evaluation of the results of intervention in the treatment of dementia in the elderly using non-drug intervention combined



with ginkgo biloba in the elderly in Nghe An province (2022-2023), *Journal of Community Medicine*, No. 66(1), pp. 39-43.