Prevalence of dementia among the elderly in Bo Xuyen ward, Thai Binh City in 2023

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ABSTRACT

A cross-sectional descriptive study on 340 elderly people living in Bo Xuyen ward, Thai Binh City, from January 2023 to May 2023, to describe the prevalence of dementia and some related factors on research subjects, using the screening tool of dementia Mini-Mental State Examination (MMSE) with a cutoff score of 24. The results showed that the rate of dementia was 15.0%. The risk factors that increased the dementia of the study population were age ≥ 75 years old, history of respiratory disease, and history of cardiovascular with adjusted Odds ratios (aOR) of 24.3 (95%CI: 8.8-67.14), 13.26 (95%CI: 1.04-168.5) and 3.69 (95%CI: 1.19-11.42), p< 0.05, respectively. The factor that reduced the risk of dementia was having physical activity > 120 minutes/week with aOR = 0.36 (95%CI: 0.15-0.85, p < 0.05). Intervention programs for the elderly in this setting need to focus on the early detection of chronic diseases and encourage them to participate in programs that connect entertainment and intellectual activities to improve their quality of life.

Keywords: dementia, elderly, Thai Binh

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INTRODUCTION

Rapid population aging and the growing number of older people are creating new opportunities to deal with challenges for Vietnam. According to the World Health Organization, dementia is a progressive syndrome chronic and progressive, including a decline in cognitive function (thinking ability) compared to ordinary people of the same age. This syndrome affects memory, thinking, orientation, understanding, calculation, learning ability practice, language, and judgment. A decrease in cognitive function is often accompanied by or sometimes occurs before, impaired emotional control, social behavior, or motivation [1]. Although age is the most substantial risk factor for dementia intelligence, that is not an inevitable consequence of aging. The onset of symptoms of this disease appears in people before the age of 65, called juvenile dementia, accounting for up to 9% of cases. In Vietnam, epidemiological studies in the South of Vietnam have recorded a dementia rate of 33% in people over 60 years old [2], so Vietnam currently has about 500,000 people over 60 years old age with dementia. Recent studies have proven that dementia treatment is more effective the earlier the patient arrives. However, most dementias are diagnosed late, with a gap between the first symptoms and treatment of up to 10-32 months.

Patients with forgetfulness or cognitive decline often see a doctor. General practitioners for general examination, but up to 91% of doctors miss early-stage dementia [3]. Bo Xuyen Ward is located in Thai Binh City, Thai Binh Province with a population of 16,601 people. According to the results of the 2021 Population Census [4], the Bo Xuyen ward has 2,446 older people, and the proportion of people over 60 years old in the Bo Xuyen ward is 14.73%. With an estimated rate of dementia in the elderly, according to previous domestic studies of 33% [2], the number of older people with dementia in the Bo Xuyen ward will reach hundreds of people. This issue would be a considerable cost burden for these subjects if they do not receive early and timely intervention. Therefore, we conducted this study to evaluate the prevalence of dementia and related factors in the elderly in this location.

MATERIAL AND METHODS

Research subjects

Research subjects were elderly people aged 60 years or older (born before March 1, 1963), had a permanent residence, were living in Bo Xuyen ward, Thai Binh City, and were willing to participate in the study. We excluded the elderly people with reduced communication abilities who were not able to answer the questionnaire and living alone or with a caregiver under 18 years of age.

Location and time of research

The study was conducted in Bo Xuyen ward, Thai Binh City, Thai Binh province from January 2022 to May 2023.

Research design: Cross-sectional study.

Study sample size

Based on the formula to estimate a proportion of the total population with absolute accuracy:

$$n = Z^2_{(1-\alpha/2)} \frac{p(1-p)}{d^2}$$

In which: p: rate of dementia among the elderly, choose p = 0.33 according to research by author Pham Thi Van Phuong in Long An [2]; d: absolute accuracy, d = 0.05. $Z_{1-\alpha/2}$:95% confidence level is 1.96; Calculate the minimum sample size as n = 339.

In the end, 340 people were involved in the study.

Sampling method

The sample was selected using the simple random sampling method.

Step 1: Make a list of eligible elderly people in Bo Xuyen ward, with a total of 2,446 people.

Step 2: Randomly selected 340 elderly people to invite to participate in the study. Those who did not agree to participate were replaced by the next person on the list.

Research variables

Rate of dementia according to the Mini-Mental toolkit State Examination (MMSE).

Factors related to dementia: age, gender, economic status, marital status, diseases, family history.

Data collection

Dementia screening tool: We used two data collection tools including two parts, the first one was questions about general information about the research subjects research, age, gender, occupation, illness, living habits, and family history; the second one was a set of dementia screening interview questions using a scale MMSE mental status assessment in dementia patients (Mini-Mental State Examination

(MMSE) on 6 aspects: orientation ability (10 points), recognition ability (immediate memory, 3 points), attention ability and calculate (5 points), language ability (8 points), memory ability and ability to imagine or abstract (4 points). The maximum total score on the rating scale was 30 points. Criteria for classifying dementia based on the total MMSE score:

+ No cognitive impairment / No dementia: ≥ 24

+ Mild cognitive impairment (prodromal dementia): 20 – 23

+ Moderate cognitive impairment: 4 – 19

+ Severe cognitive impairment: 0 – 13.

Information collection techniques: Direct interviews with research subjects or caregivers >18 years old according to the research questions, time for each interview was about 30 - 45 minutes.

Processing and analyzing data

The collected data was cleaned, entered using Epidata 3.1 software, and analyzed using STATA 14.0 software. Statistical tests used include calculating percentages, comparing ratios using the χ2 test, and statistical significance threshold when $p < 0.05$. We assessed associated factors by calculating odds ratio (OR) in univariate analysis and adjusted odds ratio (aOR) in multivariate analysis, the factors with $p < 0.02$ in univariate analysis were considered in the final multivariate model.

Ethical considerations

The study was approved by the Protocol Approval Council of Hai Phong University of Medicine and Pharmacy and approved by the Ward People's Committee authorities of Bo Xuyen ward, Thai Binh city, Thai Binh province. The study subjects were informed about the study objectives and provided the consent form for their participation in the study. Subject information was kept confidential and used for research purposes only.

RESULTS

Characteristics of research subjects

Male research subjects accounted for 52.1%, women accounted for 47.9%, the average age was 69.5 ± 7.4, the proportion of age group from 60 - 69 accounted for the majority (58.2%). Marital status: Married/ living together accounts for the majority with 90.0%. The proportion of older people with an education level above high school account for 26.8%. The proportion of retired elderly accounts for 70.3%, while currently working accounts for 29.7%. 92.1% of the elderly currently had health insurance (Table 1).

Table 1. Characteristics of study subjects (n = 340)

		Number	%	Mean ± SD
Sex	Male	177	52.1	
	Female	163	47.9	
Year old	60-69	198	58.2	69.5 ± 7.4
	70-79	108	31.8	
	80-89	27	7.9	
	≥ 90	7	2,1	
Academic level	Elementary	26	7.6	

	Secondary school	123	36.2
	High school	100	29.4
	On high school	91	26.8
Marital status	Married/living together	306	90.0
	Single/widowed/divorced	34	10.0
Job	Retire	239	70.3
	Civil servants	23	6.7
	Free labor	51	15.0
	Farming	27	8.0
Health Insurance	Yes	313	92.1
	No	27	7.9

**Rate of dementia among study subjects**

According to the MMSE tool, 15% of the elderly had scores < 24 (suspected of dementia), of which, 2.1% of the elderly had severe cognitive impairment (scores from 0-13), 3, 2% of elderly people had cognitive impairment (scores from 14-19) and 9.7% have mild cognitive impairment (scores from 20-23) (Table 2).

Table 2. Scores according to the MMSE screening test of research subjects

Scores	Dementia level according to MMSE set	Number	%
0-13 points	severe cognitive impairment	7	2.1
14-19 points	cognitive decline	11	3.2
20-23 points	mild cognitive impairment	33	9.7
≥ 24 points	no cognitive impairment	289	85.0
	Total	**340**	**100**

The rate of dementia was 16.4% in men, and 13.5% in women, the difference is not statistically significant with $p > 0.05$ (Figure 1).

Figure 1. Distribution of dementia prevalence by gender
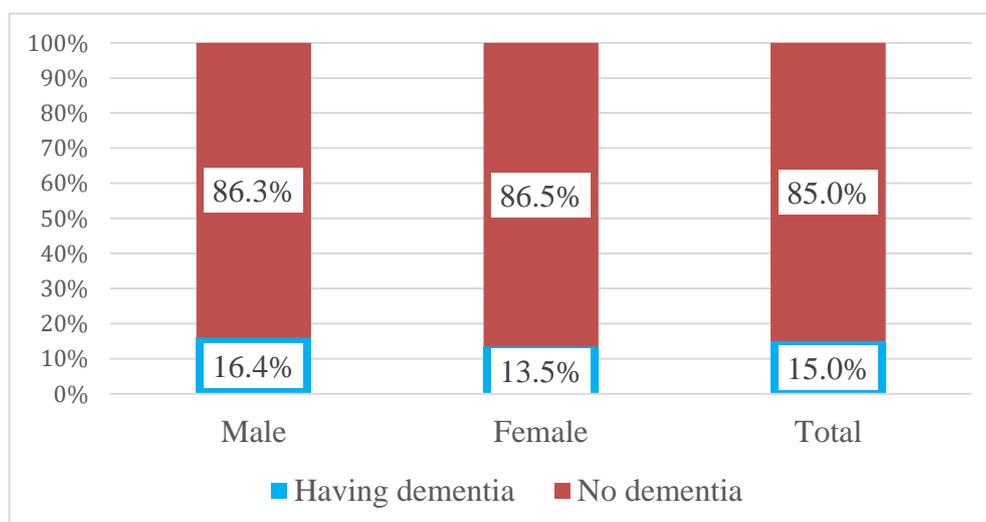
In all aspects of the MMSE tool, the average scores for recognition ability, attention and language ability, recollection/recall ability, and imagination/abstraction decreased more than the average score for orientation and language abilities (Table 3).

Table 3. *Scores according to dimensions of the MMSE toolkit of older people with dementia (n = 51)*

Side	Mean	SD	Min - Max
Orientation ability (10 points)	9.33	1.80	0-10
Recognition ability (3 points)	0.78	0.70	0-2
Attention and memory abilities (5 points)	1.80	1.32	0-5
Ability to recall/remember, imagine/abstract (4 points)	0.83	0.78	0-2
Language ability (8 points)	6.29	1.76	1-8

Some factors related to dementia in research subjects

Through univariate and multivariate analysis, we identified several factors related to dementia in the study subjects. Which, the factors were advanced age ≥ 75 years old, and a history of respiratory disease, a history of cardiovascular disease increased the risk of dementia with aOR of 24.3 (95%CI: 8.8 - 67.14); 13.26 (95%CI: 1.04 - 168.5) and 3.69 (95%CI: 1.19 - 11.42); $p < 0.05$. One factor identified to reduce the risk of dementia was exercising >120 minutes/week with aOR = 0.36 (95%CI: 0.15 - 0.85, $p < 0.05$) (Table 4). Other factors such as gender, marital/cohabitation status, occupation, history of other diseases, smoking, and alcohol consumption were not found to be related to the study subjects' dementia.

Table 4. *Some factors related to dementia in research subjects*

Variable		Dementia		OR 95%CI	aOR 95%CI
		Yes n (%)	No n (%)		
Age group	≥ 75	45 (52.3)	41 (47.7)	45.3 [#]	24.30 [#]
	60 – 74	6 (2.4)	248 (97.6)	18.2-113.1	8.80-67.14
Marital/cohabitation status	Single/widowed/divorced	12 (35.3)	22 (64.7)	3.73 [#]	1.45
	Married/living together	39 (12.7)	267 (87.3)	1.71-8.14	0.44-4.78
Job	Retirement	46 (19.3)	193 (80.7)	0.21 [#]	0.44
	Still working	5 (4.9)	96 (95.1)	0.08-0.57	0.11-1.65
History of hypertension	Yes	40 (23.0)	134 (77.0)	4.20 [#]	1.43
	No	11 (6.6)	155 (93.4)	2.07-8.52	0.49-4.16
History of respiratory disease	Yes	7 (70.0)	3 (30.0)	15.2 [#]	13.26*
	No	44 (13.3)	286 (86.7)	3.78-60.84	1.04-168.5
History of cardiovascular disease	Yes	17 (34.7)	32 (65.3)	4.01 [#]	3.69*
	No	34 (11.7)	257 (88.3)	2.01-7.99	1.19-11.42
	Yes	32 (27.1)	86 (72.9)	3.97 [#]	1.49

History of musculoskeletal disease	No	19 (8.6)	203 (91.4)	2.13-7.39	0.62-3.57
History of stroke/ Parkinson's/ cerebrovascular accident	Yes	13 (25.0)	39 (75.0)		
	No	38 (13.2)	250 (86.8)	2.19* 1.07-4.48	1.65 0.56-4.87
Exercise >120 minutes/week	No	33 (26.0)	94 (74.0)	0.26*	0.36*
	Yes	18 (8.5)	195 (91.6)	0.14-0.49	0.15-0.85
Smoke	Yes	4 (4.8)	79 (4.8)	4.42 #	2.68
	No	47 (18.3)	210 (81.7)	1.54-12.67	0.71-10.1

: <0.05, # < 0.01

DISCUSSIONS

According to the Ministry of Health, dementia in the elderly currently has no specific treatment for its symptoms. Scientists are still focusing on researching human activities that can prevent them and slow down the disease process. Our research results showed that the rate of elderly in Bo Xuyen ward with dementia according to the MMSE toolk was 15.0%, of which the majority were at the mild cognitive impairment level. The rate of elderly with dementia in our study was lower than the study by T.V.P. Pham et al in Long An (33.0%) [2] but was similar to the study by T.T.H Tran et al [5] in Hai Phong with 13.9%. This might be because our study used the same measurement tools as this study.

Regarding the characteristics of the component aspects of the tool, the results showed that the aspects with a significant decline were the ability to pay attention and memory, the ability to imagine and abstract (the average score decreased by over 70% compared to the maximum score, while orientation and language aspects were less impaired. Dementia is one of the causes of disability and dependence in the elderly. According to the literature, social functioning, education, and cognitive reserve (cognitive reserve - the brain's ability to withstand pathological damage without deterioration of cognitive function) are considered to play a crucial role in the clinical manifestations of dementia. Current evidence confirms this effect and explains that cognitive reserve may help the brain develop compensatory mechanisms to cope with pathological damage. Many factors are thought to contribute to increased cognitive reserve, and there is a growing body of evidence linking these factors to the risk of dementia. These factors include education, intelligence, occupation, and social activities throughout life [6]. To our current knowledge, our study is the first study in Thai Binh on community-based dementia screening. Although the tool only provides initial screening, specialized examinations are needed to assess the actual rate of dementia. However, these results show a need for screening and examination programs. Treatment and interventions are aimed at reducing dementia in the elderly, with a focus on programs that enhance their attention, memory, and abstraction.

Regarding factors related to dementia in the study subjects, factors that increase the risk of dementia were age ≥ 75 years old, a

history of respiratory disease, and a history of cardiovascular disease, which increases the risk of dementia. One factor identified to reduce the risk of dementia is exercising >120 minutes/week. In addition, no relationship was noted between depression and factors such as gender, marital status, occupation, smoking, alcohol consumption >5 units/day, and history of other diseases. Ligia et al [7] suggested that the risk of dementia increases in socially isolated older adults who have little contact with relatives and friends. Social organizations provide better support for social activities. Social activities stimulate the spirit and intelligence of the elderly and thus can affect health through behavioral, psychological, and physiological pathways. Gallacher and colleagues reported that people who participate less in social activities in old age and reduce their participation in social activities from middle age to old age were at double risk of dementia. Research by Thang Pham et al [8] also showed that regularly participating in cognitively stimulating activities such as reading newspapers, playing chess, and playing cards can reduce the risk of dementia caused by Alzheimer's disease. Research results by T.C.T. Nguyen et al also showed that high blood pressure was a factor that increases the risk of dementia in the elderly. The Honolulu-Asia aging study [9] showed an association between hypertension and dementia. The risk of dementia increased in people with untreated hypertension but remained unchanged in those with untreated hypertension. In our study, increased blood pressure was associated with the rate of dementia, but in multivariate analysis, no statistically significant difference was noted. Besides, exercising more than 120 minutes/week significantly reduced the risk

of dementia in our study, similar to many other studies. Thus, these results showed that the elderly need to have health checks more often to detect diseases early and receive treatment to improve their quality of life. Intervention programs need to address preventing and slowing down the process of dementia, such as encouraging the elderly to read newspapers and books, participate in regular exercise activities, and connect with senior clubs and games that combine entertainment and thinking such as chess, Chinese chess...

CONCLUSIONS AND RECOMMENDATIONS

The rate of dementia, according to the MMSE screening tool on the elderly in Bo Xuyen ward, Thai Binh City, was 15.0%. The factors of advanced age $\geq$ 75 years old, history of respiratory disease, and history of cardiovascular disease increase the risk of dementia with aOR of 24.3 (95% CI 8.8-67.14) and 13.26 (95), respectively. % CI 1.04-168.5) and 3.69 (95% CI 1.19-11.42), $p < 0.05$. The factor that reduces the risk of dementia is physical activity > 120 minutes/week with aOR = 0.36 (95% CI 0.15-0.85, $p < 0.05$). There need to be intervention programs for the elderly in this setting, focusing on the early detection of chronic diseases, encouraging the elderly to read newspapers and books, participate in regular exercise activities, and connect with elderly clubs and games that combine entertainment and mental exercise to improve the quality of life for the elderly.

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