

Prevalence of Dementia and Neuropsychiatric Symptoms among Elderly Patients Attending Outpatient Departments of Psychiatric Hospitals in Southern Thailand

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Abstract

We sought to obtain information about the prevalence of dementia, neuropsychiatric symptoms (NPSs) and the factors associated with dementia among elderly patients attending outpatient departments of psychiatric hospitals in Southern Thailand. A cross-sectional study was conducted among 200 elderly patients in outpatient departments. All participants were assessed with the Thai Mental State Examination and the Neuropsychiatric Inventory Questionnaire Thai version. The data were collected through interview questionnaires conducted from July to September, 2014. Chi-square test, Student's t test and logistic regression models were used to identify statistically significant associations. The prevalence of dementia was found to be 52 %. The prevalence of NPSs was 52.9 % among individuals with dementia. Common NPSs included nighttime motor behavior (54.8 %), depression (51.9 %), and anxiety (48.1 %). Old age (OR 2.36; 95 % CI 1.18 - 4.71) was statistically significantly associated with dementia. Higher levels of education (OR 0.16; 95 % CI 0.05 - 0.49) and having social activity (OR 0.37; 95 % CI 0.15 - 0.86) also showed statistically significant association with a decreased risk for dementia. Dementia had a moderate prevalence (52 %) while the prevalence of NPSs was 52.9 % among individuals with dementia. The top 5 symptoms were nighttime motor behavior, depression, anxiety, irritability, and delusion. The factors associated with dementia were old age, lower levels of education and lack of social activity. Therefore, assessment and investigation of dementia, NPSs and the factors associated with dementia amongst these people should be recognized and appropriate activities focusing on the individual and their family context should be established.

Keywords: Dementia, neuropsychiatric symptoms, elderly patients, outpatient departments, psychiatric hospitals

Introduction

The elderly population worldwide has been growing very rapidly because of advances in medical technology and public health systems. Between 2000 and 2050, the proportion of the world's population over 60 years is expected to double from about 11 to 22 %. The absolute number of people aged 60 years and over is expected to increase from 605 million to 2 billion over the same period [1]. In 2012, the Institute of Population and Social Research at Mahidol University, indicated that the elderly in Thailand accounted for 9.33 million or 14.46 % of the population. They projected that this will increase to 17.51 % of the population by 2020 and 25.15 % by 2030 [2]. Most older people experience health problems because of their continued degeneration and deterioration of both physical and mental health. A previous

study from Songkhla Province in Southern Thailand found that 20.8 % of the elderly residents aged 60 - 94 years had poor mental health. The factors influencing their mental health were age, physical health status, presence of chronic disease, family relationships and membership or active participation in a civic or social group [3]. Dementia becomes progressively more common in the ageing population worldwide. It can result in serious health problems in addition to physical and mental conditions that may affect the quality of life of both the elderly and their primary caregivers. Most of the primary caregivers in developing countries do not understand the nature of the illness such as co-existing behavioral, mental and emotional symptoms, and how to take care of a dementia patient [4]. However, little is known about the prevalence of dementia and neuropsychiatric symptoms (NPSs) among elderly patients attending outpatient departments of psychiatric hospitals. The aim of this study was to determine the current prevalence of dementia and NPSs among this vulnerable population. We also sought to explore the association between dementia and associated factors in this population.

Materials and methods

This cross-sectional study was conducted in outpatient departments of psychiatric hospitals in Southern Thailand from July to September, 2014. The subjects who were eligible for inclusion were 200 elderly patients aged 60 years and older who came with their caregivers to attend outpatient departments of psychiatric hospitals. Excluded were patients who had severe mental disorders, mental retardation, unwillingness to participate, inability to speak Thai or problems related to hearing and communication. Subjects were selected using purposive sampling from the 2 sites of psychiatric hospitals in Southern Thailand. Psychiatric hospitals were similar to each other. The sample size was calculated based on prevalence estimation of dementia among elderly Thais (12.4 %) [5]. The sample size calculation was considered a 95 % confidence interval. Assuming a hypothetical refusal rate of 20 %, the sample needed to include at least 200 participants.

Then 100 subjects were selected from each site. All of the participants were well informed about the content and the aim of the study. They gave written informed consent. After obtaining written informed consent, individual subjects and their primary caregivers were interviewed by one well trained psychiatric nurse at the study hospitals.

The research instrument was divided into 3 parts: Part I was composed of demographic questions including family data such as gender, age, marital status, education attainment, number of primary caregivers, family relationship and family history of psychiatric illness. Part II covered The Thai Mental State Examination (TMSE) used to screen for dementia or cognitive impairment. The total score of TMSE is 30 points and it contains 6 basic subtests concerning orientation (6 points), registration (3 points), attention (5 points), calculation (3 points), language (10 points) and recall (3 points). The cut-off point for the diagnosis of normal healthy Thai elderly for TMSE is over 23 points [6]. Part III contained The Neuropsychiatric Inventory Questionnaire Thai version (NPI-Q Thai) which was used to measure NPSs by asking the caregiver to rate the severity of the patient's symptoms. The NPI-Q Thai consisted of 12 items which included 10 behavioral and 2 neurovegetative areas: delusion, hallucination, agitation/aggression, depression, anxiety, euphoria, apathy, disinhibition, irritability, aberrant motor behavior, nighttime motor behavior, eating change [7]. Individual symptoms are rated as "No" (absent) or "Yes" (present) during the last month; subsequently, the severity of the symptoms on a 3-point scale and the caregiver distress scale using a 5-point scale [8]. The total severity score possible on the NPI-Q is 36 points. The total NPI-Q caregiver distress score is derived from adding individual symptom scores and ranges from 0 to 60. Higher scores indicate the presence of more psychiatric symptomatology [9,10].

Data analysis

We examined the frequency distributions of sociodemographic characteristics of the study participants. Characteristics were summarized using mean (\pm standard deviation) for continuous variables and counts and percentages for categorical variables. Chi-square test and Student's t test were used to determine bivariate differences for categorical and continuous variables, respectively. Subsequently, we calculated the distribution of dementia across demographic groups. Prevalence estimates of each NPS

were also determined. Logistic regression was used to calculate odds ratios (OR) and 95 % confidence intervals (95 % CIs) for the associations between dementia and sociodemographic factors. All analyses were performed using SPSS Statistical Software for Windows. All reported *p* values are 2-sided and deemed statistically significant at $\alpha = 0.05$.

Results and discussion

Results

The findings revealed that 70 % were females with an average reported age of 71.40 (± 7.0) years. Overall, a total of 104 (52 %) elderly patients had dementia (TMSE ≤ 23). The mean TMSE total score across all participants was 21.87 \pm 5.6 (22.2 \pm 5.37 for females and 21.08 \pm 6.1 for males). The sociodemographic characteristics of the study samples in relation to dementia are shown in **Table 1**. A total of 71.5 % of the elderly patients reported chronic illness while about two thirds (68 %) were physically active. Elderly patients with dementia were significantly older (mean age = 72.4 years, SD = 7.3) than those without dementia (mean age = 70.3 years, SD = 6.5). There was no significant difference between the proportions of women in the 2 groups (with dementia, 69.2 %; without dementia, 70.8 %) ($\chi^2 = 0.06$, *df* = 1, *p* = 0.81). There was a statistically significant association between dementia and sociodemographic characteristics such as education attainment (*p* value < 0.01) and age (*p* value < 0.05).

Table 2 shows the prevalence of each NPS in elderly patients with dementia. Notably, the common symptoms included nighttime motor behavior (54.8 %), depression (51.9 %), anxiety (48.1 %), irritability (44.2 %), and delusion (27.9 %). The least common symptom was euphoria (7.7 %). The NPSs with the highest symptom severity was nighttime motor behavior (1.68 \pm 0.69), while this caused the most caregiver distress (1.07 \pm 1.32). Their average NPI-Q total score was 21.87 \pm 5.62, severity score was 5.56 \pm 5.01, and caregiver distress score was 7.20 \pm 7.52.

As shown in **Table 3**, logistic regression analysis for the associated factors for dementia, after adjusting for demographic and behavioral covariates listed in the table, showed that elderly patients aged 75 years and above had a 2.4-fold increased odds (OR 2.36; 95 % CI: 1.18 - 4.71) of dementia as compared with their counterparts who were aged 60 - 74 years. Higher levels of education was associated with 84 % decreased odds (OR 0.16; 95 % CI 0.05 - 0.49) of dementia when compared with lower levels of education. Having social activity was associated with 63 % decreased odds (OR 0.37; 95 % CI 0.15 - 0.86) of dementia when compared with lack of social activity.

Table 1 Characteristics of study sample.

Characteristics	All, N = 200, n (%)	Elderly Patients without Dementia, N = 96, n (%)	Elderly Patients with Dementia, N = 104, n (%)	<i>p</i> value
Age (years) (mean \pm SD)	71.4 \pm 7.0	70.3 \pm 6.51	72.4 \pm 7.31	0.04
Age				
60 - 74	131 (65.5)	72 (75.0)	59 (56.7)	0.01
75 and above	69 (34.5)	24 (25.0)	45 (43.3)	
Gender				
Male	60 (30.0)	28 (29.2)	32 (30.8)	0.81
Female	140 (70.0)	68 (70.8)	72 (69.2)	
Marital Status				
Single/Widow/Divorced	65 (32.5)	30 (31.2)	35 (33.7)	0.72
Married	135 (67.5)	66 (68.8)	69 (66.3)	
Education attainment				
Primary school and lower	173 (86.5)	76 (79.2)	97 (93.3)	< 0.01

Characteristics	All, N = 200, n (%)	Elderly Patients without Dementia, N = 96, n (%)	Elderly Patients with Dementia, N = 104, n (%)	p value
Secondary school and higher	27 (13.5)	20 (20.8)	7 (6.7)	
Employment				
Unemployment	109 (54.5)	48 (50.0)	61 (58.7)	0.22
Employment	91 (45.5)	48 (50.0)	43 (41.3)	
Presence of chronic illness				
No	57 (28.5)	25 (26.0)	32 (30.8)	0.46
Yes	143 (71.5)	71 (74.0)	72 (69.2)	
Having family history of psychiatric illness				
None	168 (84.0)	83 (86.5)	85 (81.7)	0.36
Yes	32 (16.0)	13 (13.5)	19 (18.3)	
Physical activity				
No	64 (32.0)	27 (28.1)	37 (35.6)	0.26
Yes	136 (68.0)	69 (71.9)	67 (64.4)	
Social activity				
None	31 (15.5)	10 (10.4)	21 (20.2)	0.56
Current	169 (84.5)	86 (89.6)	83 (79.8)	

Table 2 Prevalence rate (%) of neuropsychiatric symptoms (NPSs), mean NPI-Q total score, severity score, and caregiver distress score among elderly patients with dementia (n = 104).

Symptoms	Prevalence rate (%)	NPI-Q Severity score (mean±SD)	NPI-Q Caregiver distress score (mean±SD)
Delusion	27.9	1.66±0.67	0.58±1.10
Hallucination	22.1	1.61±0.66	0.49±1.04
Agitation/aggression	20.2	1.52±0.60	0.44±0.99
Depression	51.9	1.46±0.61	0.96±1.31
Anxiety	48.1	1.54±0.61	0.97±1.33
Euphoria	7.7	1.25±1.46	0.07±0.29
Apathy	20.2	1.67±0.73	0.43±1.11
Disinhibition	12.5	1.31±0.48	0.23±0.73
Irritability	44.2	1.48±0.66	0.87±1.30
Abberant motor behavior	25.0	1.54±0.58	0.56±1.01
Nighttime motor behavior	54.8	1.68±0.69	1.07±1.32
Eating change	25.0	1.46±0.58	0.54±1.13
Total scores (mean±SD)	21.87±5.62	5.56±5.01	7.20±7.52

Table 3 OR and 95 % CIs for dementia.

Characteristics	Unadjusted OR (95 % CI)	Multivariate-adjusted OR^a (95 % CI)
Age		
60 - 74	1.0 (Reference)	1.0 (Reference)
75 and above	2.29 (1.25-4.18)	2.36 (1.18-4.71)
Education attainment		
Primary school and lower	1.0 (Reference)	1.0 (Reference)
Secondary school and higher	0.27 (0.11-0.68)	0.16 (0.05-0.49)
Social activity		
None	1.0 (Reference)	1.0 (Reference)
Current	0.46 (0.20-1.03)	0.37 (0.15-0.86)
Marital Status		
Single/Widow/Divorced	1.0 (Reference)	1.0 (Reference)
Married	0.90 (0.50-1.62)	0.87 (0.45-1.69)
Employment		
Unemployment	1.0 (Reference)	1.0 (Reference)
Employment	0.71 (0.40-1.23)	0.66 (0.35-1.25)
Having family history of psychiatric illness		
None	1.0 (Reference)	1.0 (Reference)
Yes	2.32 (0.95-5.63)	2.16 (0.88-5.30)
Gender		
Male	1.0 (Reference)	1.0 (Reference)
Female	0.93 (0.51-1.70)	0.86 (0.43-1.70)
Physical activity		
Yes	1.0 (Reference)	1.0 (Reference)
No	1.71 (0.39-1.29)	1.60 (0.82-3.11)

^aEach odds ratio is adjusted for all other covariates listed in the table

Discussion

This study indicated that there was a moderate prevalence of dementia among elderly patients attending outpatient departments of psychiatric hospitals in Southern Thailand. The results showed that more than half of our study population (52 %) had dementia. It appears to be similar to that of other elderly groups. One study found that the estimated prevalence of dementia among older adults in nursing homes varied between 12 and 95 % with a median prevalence of dementia of 58 % from 30 studies [11]. According to the prevalence of cognitive impairment among older adults aged over 70 admitted patients as an emergency to a general hospital were 50 % [12]. However, 15 previous studies reported the prevalence of dementia among the elderly population in Korea ranged from 6.3 to 13 %, which was relatively low compared to this current study [13]. The previous study done in elderly patients attending the outpatient clinics of tertiary center hospitals in Malaysia found that the prevalence of dementia was only 2.5 % [14]. The variance in prevalence may have resulted from a variety of methods, differences in study settings, variable response rates, socio-demographic differences within the subject population, or varying degrees of awareness of dementia in their caregivers [11,13-15].

The findings of our study demonstrated that the odds of dementia among elderly patients aged 75 years old and above had a 2.36 times greater risk than the patients aged 60 - 74 years. Similarly to the previous studies, it is found that the main risk factor for most types of dementia is advancing age [13,16,17]. The elderly patients with an education of at least a secondary school level had a lower risk of 0.16 times or 84 % than those who had a primary school level of education and lower. According to the previous studies, lower educational level is a risk factor for dementia [15,16]. Moreover, the elderly

patients who were still having social activity had a lower risk of 0.37 times or 63 % than those who had a lack of social activity. Social activities are defined as participating in certain common specified activities in Thailand such as playing chess or petanque, interacting with their children, friends, and other social group activities. Similarly, studies in Thailand have also shown that elderly who are still having social activities such as having membership or active participation in a civic or social group has a decreased risk for dementia [3]. In a similar way, the risk factors of dementia in this study are older aged, lower levels of education and a lack of social activity. However, the causes of dementia are complex and influenced by many factors acting in combination, while there are no definitive protective factors for dementia [16].

In the present study, the prevalence of NPSs in elderly patients with dementia was 52.9 %. Other researchers have found that the prevalence of any behavioral symptom in long term care residents with dementia varied between 38 and 92 % with a median prevalence of any behavior symptom of 78 % from 9 studies [11]. Subjects with dementia had mean scores on the NPI-Q total score of 21.87, scoring higher than the previous study. The previous study, studying a sample of 61 patients with Alzheimer's dementia, found a mean NPI score of 12.28 [18]. One possible explanation for this difference is that our subjects were a clinical sample, while the previous study evaluated people in community settings in urban areas [18]. This study shows that common NPSs included nighttime motor behavior, depression, anxiety, irritability, and delusion. The prevalence of each NPS in elderly patients with dementia identified in this study is consistent with a previous study in Thailand [19].

Our study's limitations should be taken into account when interpreting our results. First, participant selection issues may have biased prevalence estimates. We did not use random sampling, but instead considered subjects who were willing to participate in this study; thus, our findings may be subject to volunteer bias. Second, the study was conducted in all of psychiatric hospitals of Southern Thailand. Thus, the results might not be generalized to those elderly patients. Despite these limitations, our study is the first epidemiology study on dementia and NPSs among the elderly patients attending outpatient departments of all of psychiatric hospitals in Southern Thailand. Future studies that include those from all parts of Thailand are recommended. In particular, a large longitudinal study is necessary to avoid misinterpretation of the findings. It may also contribute to a better understanding of the associated factors of dementia.

Conclusions

Our study indicated that there was a moderate prevalence of dementia among elderly patients attending outpatient departments of psychiatric hospitals in Southern Thailand. The results showed that more than half of our study population (52 %) had dementia. The factors associated with dementia were old age, lower levels of education and lack of social activity. The prevalence of NPSs in elderly patients with dementia was 52.9 %. This present study shows that common NPSs included nighttime motor behavior, depression, anxiety, irritability, and delusion. These results could be used as baseline prevalence rates of dementia and NPSs in elderly patients attending outpatient departments of psychiatric hospitals to establish activities focusing on the individual and family context to improve the special care needs of this population.

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