



Original article

Functional disability in dementia: A validation study of the Thai version of Disability Assessment for Dementia scale



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ABSTRACT

Purpose: This study aimed to determine the validity and reliability of the Thai version of Disability Assessment for Dementia scale (DAD-T).

Methods: The DAD-T was administered to Thai caregivers, including 40 people with dementia [mean age 74.9 years, standard deviation (SD) 7.2 years] and 20 normal controls (mean age 69.6 years, SD 7.4 years). To study the convergent and divergent validity, the DAD-T was administered concurrently with the Thai version of Barthel Index of Activities of Daily Living (BI) and the Thai version of Mini Mental State Examination (TMSE).

Results: The mean (SD) scores on the DAD-T were 95.2 (6.0) for normal controls, 59.9 (15.6) for mild dementia, and 20.6 (17.1) for moderate to severe dementia. The DAD-T had a high correlation with both the BI ($r = 0.82$, $p < 0.001$) and the TMSE ($r = 0.91$, $p < 0.001$). The DAD-T demonstrated excellent internal, consistent reliability (Cronbach's alpha 0.98) and test–retest reliability ($r = 0.98$, $p < 0.001$). Analysis of its relationship with sociodemographic factors showed that the DAD-T score was not significantly associated with gender, age, and education.

Conclusion: The DAD-T was found to be a valid and reliable measure to assess functional disability in Thai people with dementia.

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1. Introduction

Dementia is a critical health problem in aging populations. Approximately 5–10% of individuals over the age of 65 years will develop dementia. In 2010, it was approximated that there were 35.6 million dementia patients around the world, and this number may increase to an estimated 65.7 million by 2030.¹

Dementia is characterized by cognitive impairment in memory, language, and executive function, and also by impairment in activities of daily living (ADL). The assessment of deterioration in functional abilities is included as a criterion for the diagnosis of dementia [e.g., Diagnostic and Statistical Manual of Mental

Disorders, 5th edition (DSM-5)²]. Therefore, instruments for measuring functional abilities in people with dementia are crucial in order to diagnose, monitor disease progression, plan treatment strategies, and help conduct research.

Functional abilities include basic activities of daily living (basic ADL) and instrumental activities of daily living (IADL). Basic ADL includes basic self-maintenance skills: eating, dressing, toileting, and bathing; IADL includes complex higher-order skills: meal preparation, managing finance, taking medication, and traveling.

The Disability Assessment for Dementia (DAD) scale was an instrument designed to assess both basic ADL and IADL in people with dementia. It was developed by Gélinas et al.³ and has excellent psychometric properties.

The objective of this study was to determine the reliability and validity of the Thai version of DAD (DAD-T) in the Thai elderly population.

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2. Materials and methods

2.1. Sampling

People with dementia were recruited from the Memory Clinic of Thammasat University Hospital using purposive sampling from March 2012 to September 2013. Normal control participants were recruited from other clinics at Thammasat University Hospital.

People with dementia had to fulfill the DSM-IV criteria for dementia and also have a clinical dementia rating (CDR) score⁴ of at least 1. Normal control participants had a CDR score of <1 and did not meet the DSM-IV criteria for dementia. Exclusion criteria were as follows: active cerebrovascular disease, other neurological conditions, major psychiatric disorders such as schizophrenia and major depressive disorder, and severe physical disabilities such as visual impairment or weakness. A total of 40 dementia patients and 20 normal control participants, aged 60 years and older, were enrolled in the study.

The study protocol was approved by the Human Ethics Committee of Thammasat University (protocol number: MTU-EC-PS-0-105/54).

2.2. Instruments

The DAD is an instrument designed to assess functional disability in people with dementia. Caregivers were requested to specify the performance of the patient in their functional abilities over the past 2 weeks with the responses of “no,” “yes,” or “not applicable (NA).” Six IADL and four basic ADL were evaluated. The scoring was as follows: “yes” = 1 point and “no” = 0 point. A total score was obtained by adding the score for each question and then converting this total score to a scale ranging from 0 to 100. Higher scores indicated better preserved functional abilities, whereas lower scores were associated with a poorer functional status.

The DAD-T was performed using forward and backward translation methodology. For forward translation, two independent psychiatrists translated the original instrument into Thai. Both translators discussed and compared the translations, and agreed on a reconciled version. Then the forward translation was translated back into English by an independent professional English translator. Comparison of the original DAD and the backward translation was discussed by the authors. The revised version of the DAD-T was then administered to 10 dementia patients as a pilot test.

2.3. Procedure

Demographic data on gender, age, and level of education were recorded. Then the DAD-T, the Thai version of Mini Mental State Examination (TMSE),⁵ CDR, and Thai version of Barthel Index of Activities of Daily Living (BI)⁶ were administered.

For testing the convergent validity of DAD-T, the DAD-T was administered concurrently with Thai BI scales. The divergent validity was measured by correlating the DAD-T with the TMSE. The CDR score was used to separate patients into mild (CDR = 1), moderate (CDR = 2), and severe dementia (CDR = 3) to assess the known-group validity of the DAD-T. In order to test the reliability, internal consistency analysis was performed. Furthermore, the DAD-T was administered to the same caregivers of 20 patients 2 weeks after the first interview to evaluate test–retest reliability.

2.4. Statistical analysis

The convergent validity of the DAD-T with Thai BI scale and the divergent validity of the DAD-T and TMSE were measured using Pearson's correlation. An analysis of variance was used to assess the

known group validity of the DAD-T, according to the level of disease severity. Internal consistency reliability was measured using Cronbach's alpha. Test–retest reliability was assessed by Spearman's correlation. A p value <0.05 was considered statistically significant for all tests.

Statistical analysis was conducted using the Statistical Package for the Social Sciences version 17.0 (SPSS version 17, SPSS Inc., Chicago).

3. Results

3.1. Demographic characteristics of patients

A total of 60 participants were recruited, 40 with dementia and 20 normal controls. Demographic data are shown in Table 1.

3.2. Description of the DAD-T scale

Table 2 shows the mean total score and all subscores obtained on the DAD-T for the three groups of participants: normal control, mild dementia, and moderate to severe dementia. The median of the total DAT-T score was 95.2 for normal control, 59.9 for mild dementia, and 20.6 for moderate to severe dementia groups.

Normal controls had a score of 100 on all basic ADL subscores and >85 on all IADL subscores. Patients with mild dementia were significantly impaired in IADL (subscore range 20.3–51.2) but only slightly impaired in basic ADL (subscore range 88.0–100.0). Both basic ADL (range 34.6–60.0) and IADL (range 0–12.0) subscores were obviously reduced in patients with moderate to severe dementia.

3.3. Convergent validity

The total score of the DAD-T correlated significantly with the total BI score with a Pearson correlation = 0.82 ($p < 0.001$).

3.4. Divergent validity

The DAD-T total score correlated significantly with the total TMSE score, with a Pearson correlation = 0.91 ($p < 0.001$).

3.5. Known-group validity

To explore the known-group validity, we divided participants into (1) normal control group, (2) mild dementia group, and (3)

Table 1
Demographic data.

	Normal controls	Dementia patients
Gender		
Male	13 (65%)	15 (37.5%)
Female	7 (35%)	25 (62.5%)
Age (y)	69.6 (7.4)	74.9 (7.2)
Education (y)	9.7 (5.0)	6.0 (3.6)
TMSE score	26.7 (2.5)	16.5 (6.2)
BI score	20 (0)	16.3 (4.9)
Severity		
Mild	—	25 (62.5%)
Moderate	—	10 (25%)
Severe	—	5 (12.5%)
Diagnosis		
Alzheimer's disease	—	22 (55%)
Vascular dementia	—	8 (20%)
Mixed dementia	—	7 (17.5%)
Others	—	3 (7.5%)

Data are presented as mean (SD) or n (%).

BI = Thai version of Barthel Index of Activities of Daily Living; SD = standard deviation; TMSE = Thai Mini Mental State Examination.

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