Factor Analysis and Reliability of the Family Stigma in Alzheimer's Disease Scale-Thai Version

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Objective: *To evaluate the validity and reliability of the Family Stigma in Alzheimer's Disease Scale (FS-ADS) (Thai version) in family caregivers of persons with Alzheimer's disease.*

Material and Method: *One hundred ninety-three Thai family caregivers of person with Alzheimer's disease were studied. Exploratory factor analysis with principle component analysis and varimax rotation was performed to assess factor structures. Cronbach's alpha coefficient was calculated to estimate reliability.*

Results: *The results revealed acceptable reliability with a Cronbach's alpha coefficient of 0.77. Analysis of items in each dimension (caregivers' stigma, lay persons' stigma, and structural stigma) and a comparison between the original FS-ADS and the FS-ADS (Thai version) showed that two dimensions (caregivers' stigma and lay persons' stigma) had lower number of factors and lower cumulative percentages than the original version. However, an overall comparison between the two versions showed that each factor in the Thai version was similar to that of the original version.*

Conclusion: *The overall results of exploratory factors analysis in the present study revealed good psychometric properties of the FS-ADS (Thai version). Accordingly, the FS-ADS (Thai version) was found to be a reliable and valid instrument for assessing stigmatization experienced by the Thai family caregivers providing care to persons with Alzheimer's disease. Some questions on the FS-ADS (Thai version) may benefit from additional modification to make this tool more appropriately adapted to a Thai sociocultural context.*

Keywords: *Family stigma in Alzheimer's disease scale, FS-ADS, Stigma, Family caregivers, Alzheimer's disease, Thai*

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There are many forms of dementia, of which Alzheimer's disease (AD) is one of them. AD is an evolving healthcare problem in Thailand and worldwide. People with AD are generally unable to take care of themselves and require care from others. Family members play a significant role in caring for patients with dementia. Several previous studies reported the family caregivers of AD patients experienced varying types and degrees of stigmatization from others[1-4]. These stigma related experiences resulted from adverse social attitudes toward the undesirable characteristic of individuals who are or act different from people in general, and these attitudes can lead to social discrimination[5]. Stigmatization among caregivers can directly and adversely affect patients because it may lead to social withdrawal of the caregivers. Caregiver withdrawal may result in patients not being taken to follow-up visits, which would likely result in treatment non-compliance and deterioration of patient condition[6,7].

Several studies have been conducted and reported that stigmatization had a significant impact on caregivers of persons with AD[1,2,8]. Several tools have been developed to assess stigmatization and its effects on family caregivers of Alzheimer's patients. The Family Stigma in Alzheimer's Disease Scale (FS-ADS) is a well-known and widely used instrument to assess the stigmatization experienced by family caregivers of persons with AD. The FS-ADS has been studied and was found to have good psychometric properties and verified reliability and validity[1,8]. The original version of the FS-ADS was developed based on the Western sociocultural context. Given the vast difference between cultures, it becomes necessary to revalidate this type of psychometric tools, often on a culture by culture basis, before they can be reliably used in a different culture. Based on our review of the literature, no previous study has set forth to translate this tool into Thai language and verify its effectiveness in Thai family caregivers of AD patients. Accordingly, the aim of the present study was to evaluate the validity

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and reliability of the FS-ADS (Thai version) in Thai family caregivers of person with AD.

Material and Method

This study was a cross-sectional quantitative descriptive design conducted at the Geriatric Clinic of Siriraj Hospital. The protocol for the present study was approved by the Siriraj Institutional Review Board (SIRB), Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand.

In the present study, 193 family caregivers of persons with AD were enrolled. From the rule of 3, the participant to variable ratio should be no lower than 3. In addition, Hair et al[9] proposed that the minimum sample size for exploratory factor analysis should be 100 or larger. Therefore, 193 family caregivers of persons with AD were enrolled in this study to ensure adequate sample size in case of missing data. The inclusion criteria were 1) identifying themselves as family members primarily responsible for patient's care, 2) providing care without payment or any other form of tangible remuneration, 3) age 18 or older, 4) being able to communicate in Thai language, and 5) willing to participate in the present study. Written informed consents were obtained from all subjects prior to their participation in the study.

The original FS-ADS was translated into Thai language using the forward-translation method. The instrument was translated from English into Thai after receiving permission form the copyright holder of the original FS-ADS[8]. The original English and Thai languages was translated by an expert with a high level of proficiency in both English and Thai language. The authors of the present study examined and evaluated the translated Thai version of the FS-ADS to ensure correctness of meaning and utilization of language before application and testing of the FS-ADS (Thai version).

The FS-ADS (Thai version) is a questionnaire-based instrument that consists of two main parts, as described below.

Part 1: This part of the questionnaire was used to collect demographic, health-related, and care-related information about the caregiver including age, gender, marital status, education, occupation, personal income, relation to the person receiving care, underlying illnesses, experience in caring for persons with AD, average number of hours of care provided each day, and the age of the person receiving care.

Part 2: This part of the questionnaire is the FS-ADS (Thai version) survey. Werner et al developed the FS-ADS in 2011 from their study of existing literature on stigmatization experienced by family members that provide care to persons with mental illness, in combination with finding from a qualitative study designed to systematically explore the subjective experience of stigmatization in 10 family members who provided care to people with AD[8]. They found three core elements that related to stigmatization experienced by caregivers, as cognitive-attributions, emotional reactions, and behavioral response. They also found that stigmatization was experienced in the following three dimensions, caregivers' stigma, lay persons' stigma, and structural stigma. These findings led to the development of the FS-ADS. The original version of the FS-ADS consists of 100 items. Exploratory factor analysis was performed and some items that did not reflect stigma experience were removed from the questionnaire. Therefore, the FS-ADS contains 62 items, each rated on a 5-point Likert scale, that range from 1 (fully disagree) to 5 (fully agree). A higher score indicates more experience with stigmatization resulting from providing care to a person with AD.

Statistical analysis

All construct validity and exploratory factor analyses were performed using SPSS version 22 (SPSS Inc., Chicago, IL, USA). Cronbach's alpha coefficient was calculated to determine overall reliability and the reliability of each of the stigma dimensions.

Results

Sociodemographic characteristics of caregivers of persons with AD

The mean ± standard deviation (SD) age of the participants was 51.17±12.14 years. Most caregivers were the children of person with AD (76.7%), female (86%), educated to bachelor degree (46.1%), single (51.3%), and employed (69.9%) (Table 1).

Psychometric properties of the FS-ADS (Thai version)

Data were analyzed to ensure both reliability, and construct validity.

Reliability

Cronbach's alpha coefficient that included all items was 0.77, which indicated good overall reliability. The Cronbach's alpha coefficient for each of the three dimensions was 0.77, 0.92, and 0.90 for caregivers' stigma, lay persons' stigma, and structural stigma, respectively.

Exploratory factor analysis

Prior to measuring for construct validity, the Kaiser-Meyer Olkin (KMO) and Bartlett's test of sphericity were performed to examine for the appropriateness of exploratory factor analysis. Bartlett's test of sphericity found level of significance of 0.00, which indicated an interrelationship among items in the questionnaire[9,10]. The KMO index was 0.81, which is greater than 0.5 and closer to 1. Based on these finding, exploratory factor analysis of our data was deemed to be suitable[9,10]. Principle component analysis was conducted using the dimensions caregivers' stigma, lay persons' stigma, and structural stigma. Varimax rotation was used to extract some factors.

Results of exploratory factor analysis

Exploratory factor analysis of the FS-ADS (Thai version) revealed the following factor loading value range for the three analyzed dimensions, caregivers' stigma (18 items) had factor loadings range of 0.45 to 0.81, lay persons' stigma (28 items) had factor loadings range of 0.37 to 0.68, and structural stigma (16 items) had factor loadings range of 0.34 to 0.73. The percentage of variance for caregivers' stigma, lay persons' stigma, and structural stigma for the FS-ADS (Thai version) was 16.76%, 14.20%, and 11.58%, respectively. The cumulative percentage of variance was 42.54% (Table 2).

Table 1. Sociodemographic characteristics of the family caregivers (n = 193)

Sociodemographic characteristics	n (%)
Age (year)	
<45	63 (32.6)
45 to 60	80 (41.5)
>60	50 (25.9)
Range 18 to 79 years; mean ± SD = 51.17±12.14	
Gender	
Male	27 (14.0)
Female	166 (86.0)
Marital status	
Single	99 (51.3)
Married	77 (39.9)
Widowed, divorced, separated	17 (8.8)
Educational level	
No formal education	3 (1.6)
Primary and secondary school	31 (16.0)
Diploma/certificate	17 (8.8)
Bachelor degree	89 (46.1)
Master and doctoral degree	53 (27.5)
Relationship with patients with dementia	
Spouse	19 (9.9)
Child	148 (76.7)
Son in law/daughter in law/grandchildren	26 (13.5)
Occupation	
Employed	135 (69.9)
Unemployed	58 (30.1)

Table 2. Eigenvalues, percentage of variance, and cumulative percentage of FS-ADS (Thai version)

Factors	Eigenvalue	% of variance	Cumulative %
Caregivers' stigma	10.39	16.76	16.76
Lay persons' stigma	8.80	14.20	30.96
Structural stigma	7.18	11.58	42.54

FS-ADS = Family Stigma in Alzheimer's disease Scale

Exploratory factor analysis and comparison of data between the FS-ADS (Thai version) and the original version revealed that two dimensions in FS-ADS (Thai version) (caregivers' stigma and lay persons' stigma), had lower number of factors than the original version. However, overall examination found that each question in each factor of the Thai version is similar to that of the original version (Table 3).

Discussion

The present study of the psychometric properties of FS-ADS (Thai version) was found the reliability similar to that of the original FS-ADS. The Cronbach's alpha coefficients for each individual dimension and for the total of all dimensions ranged from 0.77 to 0.92. The standard acceptable value of Cronbach's alpha coefficient is greater than 0.70[11]. As such, and according to the results of the present study, the reliability of the FS-ADS (Thai version) has higher reliability value than the standard value.

Exploratory factor analysis evaluated the following three dimensions of FS-ADS (Thai version) 1) caregivers' stigma (18 items), 2) lay persons' stigma (28 items), and 3) structural stigma (16 items). The overall variance was 42.54%, which is similar to that of the original version[8]. However, component analysis found that some items are not consistent with the original version, especially in the caregivers' stigma and lay persons' stigma. These differences may be due to differences in religions, cultures, and traditions, in addition to errors in the use of language. It is possible that the translation from the original English version is not adequately consistent with the feelings of Thai people, which is a commonly encountered problem in psychological study[12]. Accordingly, some components of the FS-ADS (Thai version) should be modified to enhance the accuracy and clarity of some questions. For the third dimension (structural stigma), which assesses caregiver's opinion toward the social system, including healthcare services and healthcare

Table 3. Exploratory factor analysis of caregivers' stigma, lay persons' stigma, and structural stigma compared between the original and Thai version of FS-ADS

Factor No.	Factor name	Items		% of variance	
		Original version	Thai version	Original version	Thai version
Factor analysis for caregivers' stigma dimension					
1	Aesthetics	1, 2, 3	2, 3	8 factors = 88.0%	5 factors = 79.0%
2	Shame	4, 5, 7	1, 4, 5, 6, 7, 8		
3	Fear	6, 8			
4	Pity	9, 10	9, 10		
5	Concealment from family	11, 12	11, 12, 13, 14, 15, 16		
6	Concealment from friends	13, 14			
7	Concealment from professional	15, 16			
8	Helping with ADL; IADL	17, 18	17, 18		
Factor analysis for lay persons' stigma dimension					
1	Cognitive functioning	19, 20, 21	19, 20, 21	9 factors = 88.4%	7 factors = 76.5%
2	Physical functioning	22, 23, 24, 25	22, 23, 37		
			24, 25		
3	Aesthetics	26, 27, 28	26, 27, 28		
4	Shame	29, 33	29, 30, 31, 32, 33, 34, 35, 36, 38, 39		
5	Pity/uneasiness	30, 34, 37, 38, 39, 40			
6	Disgust	31, 36			
7	Fear	32, 35			
8	Willingness to help	41, 42, 43	40, 41, 42, 43		
9	Distancing	44, 45, 46	44, 45, 46		
Factor analysis for structural stigma dimension					
1	Structural stigma	47, 48, 49, 50, 51, 52, 53, 57, 58, 59, 60, 61, 62	47, 48, 49, 57, 58	2 factors = 71.7%	4 factors = 79.1%
			50, 51, 52, 53		
			59, 60, 61, 62		
2	Professionals' relationship	54, 55, 56	54, 55, 56		

ADL = activities of daily living; IADL = instrumental activities of daily living

professionals, the results of the present study show that the FS-ADS (Thai version) is similar to and consistent with the original version[8].

Factor analysis of the three dimensions were conducted and the results were compared between the FS-ADS (Thai version) and the original version. The results demonstrated that most questions in the FS-ADS (Thai version) were similar to and consistent with those of the original version. Only a small number of questions were found to be inconsistent with the original version. This is probably because the FS-ADS was developed for caregivers of persons with dementia in the foreign sociocultural context[13]. The application of this instrument in Thailand could lead to inconsistency on account of language and cultural differences.

Limitation

The generalizability of study results was limited. Because this study and selected participants were from only one settings, the results of this study may not be representative of all family caregivers of patients with AD.

Conclusion

The overall results of exploratory factor analysis in the present study revealed good psychometric properties of the FS-ADS (Thai version). Accordingly, the FS-ADS (Thai version) was found to be a reliable and valid instrument for assessing stigmatization experience by Thai family caregivers providing care to persons with AD. Some questions on the FS-ADS (Thai version) may benefit from additional modification to make this tool more appropriately adapted to a Thai sociocultural context.

What is already known on this topic?

Previous studies conducted in foreign countries have exposed the stigmatization that

caregivers of persons with dementia often experience. The body of knowledge about stigma continues to develop along with improvements in the FS-ADS. However, the body of knowledge about stigma in AD in a Thai sociocultural context is scarce and there is lack of quality instrument for assessing stigma Thai caregivers of person with AD.

What this study adds?

This study examined the psychometric properties of the FS-ADS (Thai version). The results demonstrate the reliability and construct validity of the instrument. The FS-ADS (Thai version) can be used to accurately assess stigma among caregivers of persons with dementia in Thai culture.

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Potential conflicts of interest

None.

References

1. Werner P, Mittelman MS, Goldstein D, Heinik J. Family stigma and caregiver burden in Alzheimer's disease. Gerontologist 2012; 52: 89-97.
2. Werner P, Goldstein D, Buchbinder E. Subjective experience of family stigma as reported by children of Alzheimer's disease patients. Qual Health Res 2010; 20: 159-69.
3. Burgener SC, Buckwalter K, Perkhounkova Y, Liu MF, Riley R, Einhorn CJ, et al. Perceived stigma in persons with early-stage dementia: Longitudinal findings: Part 1. Dementia (London) 2015; 14: 589-608.
4. Werner P, Heinik J. Stigma by association and Alzheimer's disease. Aging Ment Health 2008; 12: 92-9.
5. Park S, Park KS. Family stigma: a concept analysis. Asian Nurs Res 2014; 8: 165-71.
6. Larson JE, Corrigan P. The stigma of families with mental illness. Acad Psychiatry 2008; 32: 87-91.
7. Dardas LA, Simmons LA. The stigma of mental illness in Arab families: a concept analysis. J Psychiatr Ment Health Nurs 2015; 22: 668-79.
8. Werner P, Goldstein D, Heinik J. Development and validity of the Family Stigma in Alzheimer's disease Scale (FS-ADS). Alzheimer Dis Assoc Disord 2011; 25: 42-8.
9. Hair JF, Black WC, Babin BJ, Anderson RE. Multivariate data analysis. 7th ed. New Jersey: Pearson Prentice Hall; 2010
10. Dixon JK. Exploratory factor analysis. In: Kellar SP, Kelvin EA, editors. Munro's statistical methods for health care research. 6th ed. Philadelphia: Lippincott Williams & Wilkins; 2013: 371-98.
11. Polit DF, Beck CT. Essentials of nursing research. Philadelphia: Lippincott Williams & Wilkins; 2014.
12. Rogler LH. The meaning of culturally sensitive research in mental health. Am J Psychiatry 1989; 146: 296-303.
13. Maneesriwongul W, Dixon JK. Instrument translation process: a methods review. J Adv Nurs 2004; 48: 175-86.

การวิเคราะห์องค์ประกอบเชิงสำรวจและความเชื่อมั่นของแบบสอบถามความรู้สึกเป็นตราบาปในญาติผู้ดูแลผู้ป่วยภาวะสมองเสื่อมฉบับภาษาไทย

สุดารัตน์ เพียรชอบ, วีรศักดิ์ เมืองไพศาล, ปิติพร สิริทิพากร

วัตถุประสงค์: *เพื่อทดสอบความความเที่ยงตรงและความเชื่อมั่นของแบบสอบถามความรู้สึกเป็นตราบาปในญาติผู้ดูแลผู้ป่วยภาวะสมองเสื่อมฉบับภาษาไทย*

วัสดุและวิธีการ: *ญาติผู้ดูแลผู้ป่วยภาวะสมองเสื่อมจำนวน 193 คน เข้าร่วมในการศึกษาครั้งนี้ เพื่อทดสอบความเชื่อมั่นโดยการหาค่าสัมประสิทธิ์แอลฟาของครอนบาค และทดสอบความเที่ยงตรงด้วยการวิเคราะห์โดยใช้สถิติการวิเคราะห์องค์ประกอบเชิงสำรวจแบบ principal component analysis หมุนแกนองค์ประกอบโดยวิธี varimax*

ผลการศึกษา: *ผลการวิเคราะห์ พบว่าแบบสอบถามความรู้สึกเป็นตราบาปในญาติผู้ดูแลผู้ป่วยภาวะสมองเสื่อมฉบับภาษาไทยมีความเที่ยงอยู่ในเกณฑ์ที่ยอมรับได้โดยมีค่าสัมประสิทธิ์แอลฟาของครอนบาค เท่ากับ 0.77 นอกจากนี้ในการศึกษาครั้งนี้ ยังพบว่าแบบสอบถาม FS-ADS ฉบับภาษาไทยมี 2 องค์ประกอบหลัก ได้แก่ caregivers' stigma และ lay persons' stigma มีจำนวนองค์ประกอบและค่าความแปรปรวนสะสมน้อยกว่าต้นฉบับ อย่างไรก็ตามเมื่อพิจารณาโดยรวมพบว่าข้อคำถามในแต่ละองค์ประกอบหลักของแบบสอบถามฉบับภาษาไทยยังคงมีความคล้ายคลึงต้นฉบับ*

สรุป: *แบบสอบถามความรู้สึกเป็นตราบาปของผู้ดูแลผู้ป่วยภาวะสมองเสื่อมฉบับภาษาไทยนี้ เป็นแบบสอบถามที่มีความเที่ยงและความเชื่อมั่นอยู่ในเกณฑ์ที่ดี สามารถนำมาใช้ในการประเมินความรู้สึกเป็นตราบาปในผู้ดูแลผู้ป่วยภาวะสมองเสื่อมได้ และเพื่อให้สามารถวัดความรู้สึกเป็นตราบาปมีคุณสมบัติทางจิตมิติดียิ่งขึ้น ควรมีการพัฒนาและปรับปรุงข้อคำถามให้มีความชัดเจนเหมาะสมในบริบทสังคมไทยต่อไป*

Appendix.

ตัวอย่าง แบบสอบถามความรู้สึกเป็นตราบาปของผู้ดูแลผู้ป่วยภาวะสมองเสื่อม

กรุณาทำเครื่องหมาย ✓ ลงในช่องคะแนนที่ตรงกับความคิด/ความรู้สึกของคุณมากที่สุด โดย

5 คะแนน หมายถึง ตรงกับความคิด/ความรู้สึกของคุณมากที่สุด

4 คะแนน หมายถึง ตรงกับความคิด/ความรู้สึกของคุณมาก

3 คะแนน หมายถึง ตรงกับความคิด/ความรู้สึกของคุณปานกลาง

2 คะแนน หมายถึง ตรงกับความคิด/ความรู้สึกของคุณน้อย

1 คะแนน หมายถึง ตรงกับความคิด/ความรู้สึกของคุณน้อยที่สุด

ข้อคำถาม	ระดับความคิด/ความรู้สึก				
	5	4	3	2	1
ความคิด/ความรู้สึกของคุณที่มีต่อผู้ป่วย					
1. ดูสกปรก					
2. ถูกทอดทิ้ง					
3. ดูไม่ดี					
4. น่าละอายใจ					
5. น่าอับอาย					
6. รู้สึกกลัว					
7. รู้สึกเสียหน้า/ขายหน้า					
…….					
คุณคิดว่าคนอื่นๆ คิดอย่างไรกับผู้ป่วยสมองเสื่อม…..	ระดับความคิด/ความรู้สึก				
	5	4	3	2	1
29. ละอายใจ					
30. อับอาย					
31. รังเกียจ					
32. รู้สึกกลัว					
…….					
คุณคิดว่าปัจจุบัน……	ระดับความคิด/ความรู้สึก				
	5	4	3	2	1
47. มีการบริการชุมชนที่เพียงพอสำหรับผู้ป่วยอัลไซเมอร์					
48. มีแหล่งให้ความรู้สำหรับผู้ป่วยอัลไซเมอร์					
49. มีบริการชุมชนสำหรับผู้ป่วยอัลไซเมอร์					
50. แพทย์มีความสามารถวินิจฉัยโรคอัลไซเมอร์ได้					
51. แพทย์มีความสามารถในการรักษาโรคอัลไซเมอร์ได้					
…….					
คุณคิดว่าคุณจะสามารถ……	ระดับความคิด/ความรู้สึก				
	5	4	3	2	1
59. ได้รับข้อมูลจากแหล่งข้อมูลที่มีความเชี่ยวชาญถ้าคุณต้องการ					
60. ได้รับข้อมูลเกี่ยวกับการรักษาผู้ป่วยอัลไซเมอร์					
…….					