TRANSLATION AND VALIDATION OF A BAHASA MALAYSIA (MALAY) VERSION OF THE ACTIVITIES OF DAILY LIVING QUESTIONNAIRE (ADLQ)

Nisa NIN[1], Yusof K[2], Hafizan NAN[2], Dahlan A[2], and Sultan Ibrahim SA[2].

[1]Occupational Therapy Department, Hospital Raja Permaisuri Bainun, Jalan Ashman Shah, 30450 Ipoh, Perak
[2]Centre for Occupational Therapy Studies, Faculty of Health Sciences, Universiti Teknologi MARA (UiTM) Kampus Puncak Alam, 42300 Bandar Puncak Alam, Selangor, Malaysia

Correspondence:
Akehsan Dahlan,
Centre for Occupational Therapy Studies,
Faculty of Health Sciences,
UiTM Puncak Alam Campus,
42300 Bandar Puncak Alam, Selangor, Malaysia
Email: akehsan@uitm.edu.my

Abstract

The ability to perform activities of daily living (ADL) and instrumental activities of daily living (IADL) can indicate the functional status of elderly individuals with dementia. The Activities of Daily Living Questionnaire (ADLQ) is a widely used informant-based assessment tool for measuring functional abilities in individuals with dementia. However, the original ADLQ is in English and not applicable to the Bahasa Malaysia language. This study aimed to translate and validate the ADLQ into Bahasa Malaysia to address this gap of knowledge.

The study conducted a cross-sectional study among primary caregivers of elderly individuals with dementia. Forward and backward translations were used to translate the ADLQ into Bahasa Malaysia. The validity of the translated ADLQ was evaluated through face and content validity, concurrent and convergent validity, and test-retest reliability.

The Bahasa Malaysia version of the ADLQ achieved excellent agreement in both face and content validity, with an average Face Validity Index (FVI) score of 0.95 and an average Content Validity Index (CVI) score of 0.94. The Modified Kappa (k*) agreement for the translated ADLQ was 0.93, indicating substantial agreement between the translators. Concurrent validity was established through a strong correlation between the original English version and the translated ADLQ for the total score (r = 0.93, p < 0.05), total percentage (r = 0.94, p < 0.05), and total points (r = 0.84, p < 0.05). Convergent validity was established through a strong correlation between the ADLQ-BM and the Bristol Activities of Daily Living Scale (BADLS) (r = 0.85, p < 0.05). Finally, the test-retest reliability achieved very strong correlations for the total score (r = 0.94, p < 0.05) and total percentage (r = 0.95, p < 0.05), and a strong correlation for the total points (r = 0.88, p < 0.05).

In conclusion, the Bahasa Malaysia version of the ADLQ is a valid and reliable assessment tool for measuring functional abilities among elderly individuals with dementia. The excellent agreement in the face and content validity and the strong correlation in concurrent and convergent validity indicate that the translated ADLQ is a robust tool for assessing functional abilities in elderly individuals with dementia in Malaysia. The findings of this study can provide valuable information for clinicians and researchers in Malaysia who wish to evaluate the functional abilities of elderly individuals with dementia.

Keywords: Activities of Daily Living Questionnaire, Elderly, Dementia, Functional Ability

Introduction

The global population of individuals aged 60 and older is projected to reach 2.1 billion by 2050. Ageing is often accompanied by various conditions that can have a significant impact on cognitive functions, among which dementia is a prominent concern. Dementia affects over 55 million people worldwide, with approximately 10 million new cases being diagnosed each year (1, 2). This alarming trend highlights the pressing need for effective strategies to address the challenges posed by dementia, including early detection, accurate diagnosis, and comprehensive care. With the increasing number of older adults at risk of developing dementia, it is crucial to prioritize research,

education, and resources to improve the quality of life for individuals living with this condition and support their families and caregivers. In Malaysia, the prevalence of dementia among individuals aged 60 and above is reported to be 8.5%, with a higher incidence among older females, singles, the unemployed, and those residing in rural areas (3). Dementia is a neurological syndrome that impairs cognitive functions, including memory, reasoning, attention, and language, leading to a loss of independence in daily activities (4).

Recent systematic reviews indicate that as the disease progresses from mild cognitive impairment to early symptoms of dementia and eventually severe Alzheimer's disease (AD), the impact of cognitive dysfunction on everyday activities becomes more significant (5). Challenges in activities such as personal care, particularly bathing, dressing and functional mobility, are observed in the 60 years and above age group (23.6% to 28.7% in women and 20% to 21.4% in men) (6). Moreover, individuals with very mild AD experience difficulties in instrumental activities of daily living (IADL), such as managing finances and medications, while basic activities of daily living (ADL) impairment is evident in dressing (7).

Individuals with dementia encounter numerous difficulties in their daily lives, which profoundly affect them and their families (4, 5, 7). For instance, they may struggle with personal hygiene or performing household tasks like cooking and cleaning. Consequently, they become dependent on family members or caregivers for assistance, imposing a burden on their loved ones (4, 7). Additionally, social isolation may occur as they struggle to communicate effectively or engage in social activities, leading to feelings of loneliness and depression, exacerbating their cognitive decline (5, 7). Therefore, it is crucial to develop effective tools and assessments to evaluate the daily functioning of individuals with dementia, providing appropriate support and care to enhance their quality of life.

Several instruments are available to evaluate the performance of individuals with dementia in activities of daily living (ADL), such as the Barthel Index, the Lawton-Brody Instrumental Activities of Daily Living Scale, the Functional Activities Questionnaire, and the Montreal Cognitive Assessment (8). However, the Activities of Daily Living Questionnaire (ADLQ) is considered the most comprehensive assessment tool for ADL and IADL evaluation (8). It was originally developed by Johnson et al. (8) based on clinical experience with dementia and an understanding of functional decline areas likely to impact ADL. It covers six domains: self-care, household care, employment and recreation, shopping and money, travel, and communication. Items are rated on a 4-point scale ranging from 0 (no problem) to 3 (no longer capable of performing the activity).

However, there is a lack of available instruments in the Malay language to assess activities of daily living in elderly individuals with dementia. Therefore, this study aimed to translate and validate the ADLQ into Bahasa Malaysia. The translated version of the Activities of Daily Living Questionnaire in Bahasa Malaysia would be highly beneficial, particularly for occupational therapists administering it to elderly individuals in Malaysia whose first language is Bahasa Malaysia.

Methodology

This study used Tsang's translation and validation guideline (9) with two phases: translation and validation. The translation phase included forward and backward translations, the establishment of an expert committee, and preliminary pilot testing. The validation phase involved evaluating the reliability and validity of the questionnaire. Ethical approval for this study was obtained from the Ethical Committee of Universiti Teknologi MARA and consent was obtained from all participations involved in each phase of the study.

During the forward translation, one independent translator and the researchers (T1 and T2) certified in Teaching English as a Second Language (TESL) by the Institute of Teacher Education Malaysia translated the original ADLQ from English to Malay. Through discussions with the research team, both versions were harmonised to create the pre-final version of the Activity of Daily Living Questionnaire – Bahasa Malaysia (ADLQ-BM). This pre-final version was then translated back to English by two independent translators (T3 and T4).

Both independent translators translate the ADLQ-BM back into English. T3 was certified in English Language Studies from the National University of Malaysia, while T4 was certified in the foundation of TESL. Both backwards-translated versions were compared with the pre-final version and the original version. A discussion with the expert committee followed this stage. The committee discussed the discrepancies, and all the expert committees agreed on the overall questionnaire; thus, the pre-final version of the Bahasa Malaysia of ADLQ (Pre-final ADLQ-BM) was produced.

Pilot testing was conducted on the pre-final version of the ADLQ-BM. The pilot testing consists of face validity testing, content validity and concurrent validity testing, convergence validity testing and test-retest reliability testing.

For face validity, the Pre-final ADLQ-BM was distributed to 20 Malaysian primary caregivers through face-to-face questionnaires aged 18 and above, taking care of elderly aged 60 and above, and can understand and answer questionnaires in Malay. Each caregiver evaluated their comprehension and the item's clarity using a 5-point Likert scale, with 1 being a very low level of understanding and clarity and 5 being a very high understanding and clarity. Items rated one or two were counted as disagreement, while three, four, and five were counted as agreement. Microsoft Excel 2019 was used to analyse the data and generate the Face Validity Index (FVI) and Average Face Validity Index (Ave-FVI).

The ADLQ-BM was evaluated by six occupational therapists and four academicians for content validity. Each item was evaluated on its relevance, clarity, simplicity, and ambiguity using a 4-point Likert scale: (1) not relevant/ not clear/ not simple/ (2) doubtful, need modification, (3) relevant/ clear/ simple/ no doubt but need minor revision; and (4) very relevant/ clear/ simple/ no doubt. Items rated with one or two were counted as disagreement, while three or four were counted as agreement. The Item Content Validity Index (I-CVI), Average Content Validity Index (Ave-CVI), and Modified Kappa (k*) agreements were calculated using data analysis in Microsoft Excel 2019.

The study then proceeded to analyse the concurrent validity of both the original English version of ADLQ and the translated version of ADLQ-BM by using the Pearson correlation coefficient (Pearson's r), with the strength of the association determined according to Cohen's guidelines. A small or low strength of association was identified as 0.10-0.29, while a medium strength of association was identified as 0.30-0.49, and a large and strong association was identified as 0.50-1.00 (10). The questionnaire was distributed to 51 primary caregivers aged 18 and above who live in communities in Kuala Lumpur, Selangor, Johor, and Kelantan and are proficient in both English and Bahasa Malaysia. Two weeks after the first administration, the ADLQ-BM was re-administered. The two weeks duration was given as it is essential for assessing reliability, test-retest consistency, and to avoid potential practice effects (11, 12). Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 20 for validity and reliability.

In addition, the study also conducted the convergence validity of the ADLQ-BM. The convergent validity between the ADLQ-BM (total score of impaired functioning) with the total score of the Bristol Activities of Daily Living Scale (BADLS) was analysed using the Pearson correlation coefficient (Pearson's r). The correlation was categorized as follows: 0.01-0.19 indicating a very weak relationship; 0.20-0.39, weak relationship; 0.40-0.59, moderate relationship; 0.60-0.79, strong relationship; and ≥ 0.80, very strong relationship (12). The total score of BADLS represents total dependency in daily living activities among the elderly. The higher the score, the higher the dependency level in daily functioning.

Finally, the test-retest reliability was conducted to establish the internal validity and stability of the ADLQ-BM over time. Fifty-one caregivers participated in this study through a face-to-face interview. The inclusion criteria are: aged 18 and above, taking care of elderly aged 60 and above, and can understand and answer questionnaires in the Malay language. The re-test of the ADLQ-BM was conducted two weeks after the initial test. The results were analysed using the Pearson correlation coefficient (Pearson's r). The correlation between the results of the initial test and two weeks after that was categorised as follows: ≤ 0.20, very weak correlation; 0.20-0.40, weak correlation; 0.40-0.70, moderate correlation; 0.70-0.90, strong correlation; and 0.90-1.00, very strong correlation (12).

Results

Results for the demographic participants from the face and the content validity show that 60% (n = 12) are female, the age ranges from 30 – 40 years old (50% n = 10), living at home and caring for their parents. The results of the I-FVI scores ranging from 0.89 to 0.99 showed almost perfect agreement with the items' comprehension. Meanwhile, I-FVI scores ranging from 0.91 to 1.00 also showed almost perfect agreement with the items' clarity, as shown in Table 1.

Table 1: Face validity by the primary caregivers (n = 20)

Item	Co	Cl
	I-FVI	
Self-Care Activities	**0.98**	**0.99**
A. Eating	0.99	1.00
B. Dressing	0.97	0.97
C. Bathing	0.97	0.96
D. Elimination	0.96	0.95
E. Taking pills or medication	0.94	0.95
F. Interest in personal appearance	0.93	0.93
Household Care	**0.94**	**0.95**
A. Preparing meals	0.95	0.96
B. Setting the table	0.96	0.96
C. Housekeeping	0.96	0.96
D. Home maintenance	0.94	0.95
E. Home repairs	0.93	0.94
F. Laundry	0.95	0.95
Employment and Recreation	**0.92**	**0.91**
A. Employment	0.93	0.95
B. Recreation	0.91	0.92
C. Organizations	0.89	0.91
D. Travel	0.97	0.96
Shopping and Money	**0.93**	**0.92**
A. Food shopping	0.94	0.95
B. Handling cash	0.95	0.96
C. Managing finances	0.96	0.95
Travel	**0.94**	**0.94**
A. Public transportation	0.91	0.93
B. Driving	0.95	0.95
C. Mobility around neighbourhood	0.96	0.96
D. Travel outside familiar environment	0.94	0.94
Communication	**0.96**	**0.97**
A Using telephone	0.95	0.95
B. Talking	0.96	0.96
C. Understanding	0.97	0.95
D. Reading	0.95	0.95
E. Writing	0.94	0.96
Ave-FVI	0.95	0.95

Co Comprehension, Cl Clarity, I-FVI Item Face Validity Index, Ave-FVI Average Face Validity Index

Results from the Validation phase indicated that almost all caregivers (80.4%) were between 18 and 30 years old, while most of the caregivers were female (82.4%). In addition, the majority of the participants taking care of their elderly were their sons or daughters (52.9%). All of the elderly currently lives in their own homes (100%). The demographic characteristics of the participants in the validation phase are shown in Table 2.

Table 2: Demographic characteristics of primary caregivers of elderly with dementia (n = 51)

Characteristics	n (%)
Age	
18 – 30 years old	41 (80.40)
31 – 40 years old	6 (11.80)
41 – 50 years old	1 (2.00)
51 – 60 years old	3 (5.80)
Gender	
Female	42 (82.40)
Male	9 (17.60)
Relation to the older person	
Son/Daughter	27 (52.90)
Relatives	12 (23.50)
Others	12 (23.50)

The test-rest reliability result indicates 19 dropouts after the second administration to the 51 primary caregivers. Only 32 primary caregivers could participate and be included in the investigation of test-retest reliability. The ADLQ-BM achieved very strong test-retest reliability for the total score and the total percentage of the ADLQ-BM with r = 0.94, p < 0.05, and r =0.95, p < 0.05, respectively. The total points of the ADLQ-BM achieved a strong correlation with r = 0.88, p < 0.05. Furthermore, the total score and the total percentage in Household Care Subscales achieved the highest test-retest reliability than other subscales with a very strong correlation where r = 0.91, p < 0.05. However, the correlation between items in the test-retest of the ADLQ-BM ranged from weak correlation, r = 0.37, p < 0.05, to very strong correlation, r = 1.00, p <0.05 as shown in Table 3.

Content validity. Excellent agreement was reached on all items' relevance thus no items were changed or removed. The I-CVI varied from 0.90-1.00 for the items' clarity, simplicity, and ambiguity, while the Ave-CVI ranged from 0.96-0.98. Results can be seen in Table 4.

Concurrent validity. The total number of participants involved in concurrent validity was 51 primary caregivers of elderly with dementia. The correlation between the overall total score and the total percentage of ADLQ-BM and ADLQ-BI showed a significant, very strong, positive correlation with r = 0.93 and 0.94, p < 0.05, respectively.

Table 3: Test-retest ADLQ-BM

NO.	QUESTIONS	Test ADLQ-BM (mean, SD)	Retest ADLQ BM (mean, SD)	r	p
1.	a. Eating (*Makan*)	0.22(0.61)	0.28 (0.68)	0.78*	0.00
	b. Dressing (*Memakai pakaian*)	0.25 (0.62)	0.44 (0.91)	0.77*	0.00
	c. Bathing (*Mandi*)	0.22 (0.61)	0.28 (0.73)	0.95*	0.00
	d. Elimination (*Membuang air kecil/besar*)	0.16 (0.52)	0.16 (0.52)	1.00**	0.00
	e. Taking pills or medications (*Mengambil pil atau ubat- ubatan*)	0.91 (1.77)	1.13 (2.34)	0.68**	0.00
	f. Interest in personal appearance (*Berminat terhadap penampilan diri*)	0.47 (0.76)	0.66 (1.66)	0.67**	0.00
2.	a. Preparing meals, cooking (*Penyediaan makanan, memasak*)	0.88 (1.13)	0.91 (1.15)	0.89**	0.00
	b. Setting the table (*Menyediakan meja untuk makan*)	0.91 (1.86)	0.84 (1.82)	0.89**	0.00
	c. Housekeeping (*Pembersihan rumah*)	1.00 (1.80)	0.91 (1.73)	0.95**	0.00
	d. Home maintenance (*Penyelenggaraan rumah*)	1.34 (1.80)	1.91 (2.91)	0.49**	0.00
	e. Home repairs (*Pembaikan rumah*)	2.03 (2.91)	2.91 (3.71)	0.77**	0.00
	f. Laundry (*Mencuci pakaian*)	0.84 (1.78)	0.66 (1.13)	0.79**	0.00

Table 3: Test-retest ADLQ-BM (Continued)

NO.	QUESTIONS	Test ADLQ-BM (mean, SD)	Retest ADLQ BM (mean, SD)	r	p
3.	a. Employment (*Pekerjaan*)	2.94 (2.61)	4.06 (3.32)	0.61**	0.00
	b. Recreations (*Rekreasi*)	2.66 (2.60)	2.59 (2.61)	0.74*	0.00
	c. Organizations (*Organisasi*)	3.41 (3.48)	3.78 (2.49)	0.75 *	0.00
	d. Travel (*Bersiar-siar*)	0.66 (0.83)	1.09 (1.67)	0.37*	0.03
4.	a. Food shopping (*Membeli-belah makanan*)	1.53 (2.68)	1.19 (1.91)	0.47**	0.00
	b. Handling cash (*Mengendalikan wang tunai*)	0.38 (0.94)	1.47 (1.02)	0.96**	0.00
	c. Managing finance (*Menguruskan kewangan*)	1.34 (1.93)	1.59 (1.95)	0.22	0.23
5.	a. Public transportation (*Pengangkutan awam*)	3.72(3.58)	3.66 (3.61)	0.85**	0.00
	b. Driving (*Memandu*)	3.56 (4.09)	4.03 (4.03)	0.73**	0.00
	c. Mobility around neighborhood (*Mobiliti di kawasan kejiranan*)	0.91 (1.79)	1.13 (2.25)	0.73**	0.00
	d. Travel outside familiar environment (*Berjalan-jalan di luar persekitaran biasa*)	0.78 (2.28)	0.81 (1.82)	0.63**	0.00
6.	a. Use a telephone (*Menggunakan Telefon*)	0.84 (1.80)	1.13 (2.23)	0.84**	0.00
	b. Talking (*Berbual*)	0.28 (0.73)	0.44 (0.84)	0.85**	0.00
	c. Understanding (*Kefahaman*)	0.31 (0.69)	0.28 (0.58)	0.66**	0.00
	d. Reading (*Membaca*)	0.69 (1.69)	1.53 (2.99)	0.44*	0.01
	e. Writing (*Menulis*)	1.13 (2.24)	1.56 (2.98)	0.67**	0.00

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

Table 4: Content validity by the panel of experts (n = 6)

Item	R		C	S	A
	I-CVI	k*		I-CVI	
Self-Care Activities	0.89	0.89	0.98	1.00	0.98
Household Care	0.95	0.95	0.98	0.95	0.98
Employment and Recreation	0.98	0.98	0.95	0.98	0.95
Shopping and Money	1.00	1.00	0.95	0.95	1.00
Travel	0.95	0.95	1.00	1.00	1.00
Communication	0.89	0.89	1.00	0.90	0.98
Ave-CVI	**0.94**	-	**0.97**	**0.96**	**0.98**

[R] Relevancy, [C] Clarity, [S] Simplicity, [A] Ambiguity, [I-CVI] Item Content Validity Index, [k*] Modified Kappa agreement, [Ave-CVI] Average Content Validity Index

There was a statistically significant, strong, positive relationship between the overall total points of ADLQ-BM and overall total points of ADLQ-BI with r = 0.84, p < 0.05. The highest correlations of the total score and the total per cent between both instruments were achieved in Self-Care Activities subscales with r = 0.94 and 0.92, p < 0.05, respectively. However, the correlation between items in the concurrent validity of the ADLQ-BM ranged from weak correlation, r = 0.22, p < 0.05, to very strong, r = 0.99, p < 0.05.

Convergent validity. The convergent validity was administered to 51 primary caregivers of elderlies with dementia. There was a statistically significant, strong, positive relationship between the total score of Bristol ADL and the total score of ADLQ-BM (r = 0.85, p < 0.05).

Discussion

New therapeutic approaches for dementia treatment, particularly Alzheimer's disease (AD), have emerged. These strategies aim to not only slow down disease progression and enhance quality of life but also foster the development of assessment tools for more accurate identification of cognitive and functional dependency cases. However, many existing dementia assessment scales suffer from significant drawbacks such as low sensitivity and specificity,

lengthy administration time, and complexity, rendering them unsuitable for patients with cognitive impairment. In this study, we successfully translated and culturally adapted the ADLQ into Bahasa Malaysia for use in the Malaysian population. This study investigates the validity and reliability of the Bahasa Malaysia version of the Activities of Daily Living Questionnaire (ADLQ-BM) for caregivers of elderly individuals with dementia in Malaysia. The translation process proposed by Tsang et al. (9) was followed, which involves a translation phase (forward and backward translations, the establishment of an expert committee, and preliminary pilot testing) and a validation phase (content validity, concurrent and convergent validity, test-retest reliability).

The forward and backward translation process went smoothly, with only minor semantic differences that were resolved through discussion among the authors and translators. The ADLQ-BM showed almost perfect agreement and demonstrated semantic equivalence with the original form, making it culturally and linguistically acceptable to Malay primary caregivers of the elderly.

Furthermore, the study established a strong to very strong positive correlation between the ADLQ-BM and the original English version of ADLQ, demonstrating that the ADLQ-BM can accurately measure daily functioning among elderly individuals with dementia in Malaysia. The ADLQ-BM also strongly correlated with the Bristol Activities of Daily Living Scale (BADLS), which measures functional ability in daily living activities among elderly individuals with dementia. This supports the study's finding of convergent validity between the two instruments.

Moreover, the study found that the ADLQ-BM had good test-retest reliability, with strong to very strong correlations between the results obtained from the same sample at different points in time. The total percentage of the ADLQ-BM revealed impairment to moderate impairment in the daily functioning of elderly individuals with dementia, with the Self-Care Activities subscale showing impairment and the Employment and Recreation subscales showing moderate impairment. This is consistent with previous research indicating that basic ADL skills are relatively more preserved than higher-level tasks (5, 13, 14)

Additionally, the Travel subscale of the ADLQ-BM showed moderate impairment, indicating that elderly individuals with dementia who live at home with family members may depend more on them for activities such as driving or using public transportation. This is consistent with a previous study indicating that elderly individuals living at home depended on others for transportation and driving (14, 15). Overall, the findings of this study support the use of the ADLQ-BM as a valid and reliable instrument for assessing daily functioning among elderly individuals with dementia in Malaysia.

Implications & Limitation

The samples in this study are limited and small, implying a poor generalisation of Malaysian populations due to time constraints and a shorter duration of data collection in the study. Besides, this study also could not have completed other psychometric properties such as intra-rater reliability. Furthermore, most elderly in this research live at home, and researchers did not compare the impairments in functional abilities with those living in institutions. Other than that, the questionnaires were distributed through online platforms, and it has quite lengthy questions, thus may lead to inconsistency in their answers. Lastly, there are some dropouts during the test-retest reliability, which might affect the results of the correlation.

Conclusion

The ADLQ-BM had developed strong validity and reliability. In order to better understand the functional capacities of older Malaysians with dementia, it may be possible to use the ADLQ-BM in the future.

Conflict of interest

The authors have no conflict of interest to declare.

Ethical clearance

This study was approved by the Universiti Teknologi MARA (UiTM) Ethical Committee, reference no: [FERC/FSK/MR/2021/0004].

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