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Translation, cultural adaptation and psychometric analysis of the Activities of Daily Living Questionnaire (ADLQ) for functional assessment of patients with Alzheimer's disease

Tradução, adaptação cultural e análise das propriedades psicométricas do Activities of Daily Living Questionnaire (ADLQ) para avaliação funcional de pacientes com a doença de Alzheimer

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Abstract

Objectives: To translate and cross-culturally adapt an instrument that measures the performance of Alzheimer's patients in their activities of daily living and to analyze the psychometric properties of the instrument. **Methods:** The sample consisted of 60 patients and their 60 respective caregivers. The instrument was translated using the back-translation technique in association with the bilingual method. The caregivers gave responses to the translated version, and the Mini Mental State Examination (MMSE) was applied to the patients. Psychometric analysis was conducted by means of the validity of the instrument measures. **Results:** The results showed an inversely significant correlation (-0.793) at the 5% level between the instruments, and 62% of the total variance was explained. The inter-item correlation matrices demonstrated that some items correlated with the overall measurements of functional capacity in a slightly positive, non-significant manner. Correlation between the items of the translated instrument and the MMSE made it possible to test the internal coherence of the instrument with an already validated instrument. The variables that correlated significantly with the MMSE were selected, thus suggesting that the instrument could be further condensed. The *t* test for correlated items showed that the measures of the translated ADLQ version and the condensed version did not differ statistically at a significance level of 5%, such that the simplification of the instrument did not change the mean level of functional dependency. Factorial analysis carried out using varimax rotation indicated six dimensions. **Conclusion:** This study introduces a new functional assessment tool with the aim of contributing to a more precise measurement of the patient's functional status by all healthcare professionals.

Key words: Alzheimer's disease; assessment; validity.

Resumo

Objetivos: Realizar a tradução e a adaptação transcultural de um instrumento de medida do desempenho das atividades de vida diária de pacientes com a doença de Alzheimer e analisar as suas propriedades psicométricas. **Métodos:** A amostra foi composta por 60 pacientes e os respectivos 60 cuidadores. A pesquisa ocorreu com a tradução do instrumento pela técnica de retrotradução associada ao método bilíngue. A versão traduzida foi respondida pelo cuidador e o Mini Exame do Estado Mental (MEEM) aplicado ao paciente. A análise psicométrica foi realizada por meio da validade das medidas do instrumento. **Resultados:** Os resultados verificaram uma correlação inversamente significativa (-0,793) ao nível de 5% entre os instrumentos, com uma explicação da variância total de 62%. As matrizes de correlação interitens demonstraram que alguns itens se correlacionam com as medidas globais de capacidade funcional de forma pouco positiva e significante. A correlação realizada entre os itens do instrumento traduzido com o MEEM permitiu testar a coerência interna do instrumento com um já validado. As variáveis correlacionadas significativamente com o MEEM foram selecionadas, sugerindo um instrumento mais condensado. Por meio do teste *t* para amostras correlacionadas, as médias do ADLQ-versão traduzida e versão condensada não diferem estatisticamente ao nível de 5% de significância, de forma que a simplificação do instrumento não alterou a média do nível de dependência funcional. A análise fatorial realizada pela rotação Varimax indicou seis dimensões. **Conclusão:** O estudo disponibiliza uma nova ferramenta de avaliação funcional, visando contribuir para a mensuração mais cuidadosa do estado funcional do paciente por todos os profissionais da área da saúde.

Palavras-chave: doença de Alzheimer; avaliação; validade.

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Introduction

Population aging is a global phenomenon. Among the most frequent health problems in old age is dementia, which is characterized by a decline in cognitive function, including memory, and an interference in occupational and social functioning. In this phase of life, the prevalence of dementia doubles with every five-year increment in age, varying from 3% at the age of 70 to 20-30% at the age of 85[1]. Alzheimer's disease (AD) is the most common type of dementia and affects 1-6% of the world's population. In Brazil, it is estimated that 6% of the 15 million people over the age of 60 are AD carriers. The incidence rates in the Brazilian population are comparable to those reported in Western and Asian studies[2,3].

Cognitive impairment is the main clinical complaint of AD patients. In the patient's clinical evaluation, it is necessary to identify the degree of cognitive impairment so that effective rehabilitation programs can be proposed as part of a non-pharmacological intervention. The aim of this kind of intervention is to delay the progress of AD as well as facilitate an improvement in quality of life [4-6]. However, the evaluation of dementia patients is not limited to identifying cognitive impairments. Changes in the performance of activities of daily living (ADLs) are also observed in most of these individuals, although the detection of several of these symptoms often depends on the information supplied by the patient's caregivers[7,8]. The assessment of functional capacity has been shown as an important aspect of diagnosing dementia and it should be used to guide healthcare professionals, as well as caregivers, about appropriate care. For all these reasons, the assessment of ADLs is increasingly recognized as a valuable outcome measure in clinical tests[9].

Although the concept of functional capacity is quite complex and encompasses deficiency, incapacity, disadvantage, as well as autonomy and independence, in practice, we work with the concept of capacity/incapacity[10]. Functional incapacity is defined by difficulty while performing certain gestures and ADLs or even the impossibility of performing these activities[7]. Two main types of abilities are measured by functional assessment scales: ADLs, which consist in activities carried out regularly such as getting dressed, bathing and eating. In contrast, the instrumental activities of daily living (IADLs) require organization and planning and include tasks such as shopping, using public transportation, preparing meals, managing finances, housekeeping and using the telephone[10,11].

The Activities of Daily Living Questionnaire (ADLQ) was developed to assess basic and instrumental activities of AD patients, and it quantifies the functional abilities of individuals with cognitive impairment, such as dementia. This questionnaire was originally based on clinical experience with dementia patients and on the knowledge of areas of functional decline which could possibly impact ADLs. It has been consistent with other measures in the detection of functional decline in individuals with possible AD[9]. The main objectives of the present study were to translate and cross-culturally adapt the ADLQ to Brazilian Portuguese and to analyze the instrument's psychometric properties.

Methods

The present study was developed with caregivers and AD patients of the support group called "Cuidando de quem cuida" ("Caring for caregivers") in the city of Natal, RN. The sample consisted of 60 caregivers and 60 patients with AD. The inclusion criteria for patients were: medical diagnosis of possible AD based on the criteria used in clinical practice (NINCDS-ADRDA and DSM-IV), no neurodegenerative disease (Parkinson's disease) or neurovascular disease (stroke), age of 60 years or above, at any stage of AD. Caregivers were included in the study if they were the patient's primary caregiver and if their patient fit the inclusion criteria mentioned above.

Procedures

Translation and cross-cultural adaptation of ADLQ

The translation and cross-cultural adaptation of the ADLQ to Brazilian Portuguese were authorized by the developers of the original instrument and were also approved by the Research Ethics Committee of Universidade Federal do Rio Grande do Norte (UFRN) under protocol 187/05 CEP.

The ADLQ is divided into six domains which assess different activity areas: self-care, household care, employment/recreation, shopping/money, travel and communication. Each domain has between three and six items, each one scored on a four-point scale ranging from 0 (no problem) to 3 (no longer capable of performing the activity). For each item, there is also a value (9) supplied for those activities which the patient has never performed ("I have never performed this activity") or stopped performing before the onset of dementia (retirement before the dementia symptoms became apparent) and for the items which the marker (caregiver), for whatever reason, cannot answer ("I don't know"). The score is calculated as follows: the total number of answered questions for each section is counted (except for the question number 9, "I don't know" or "I never was responsible for this activity"), and the total number of the answered questions is multiplied by three, which represents the maximum score for that domain. The total score (i.e. the sum of the answers) for that domain is then calculated and divided by the maximum score. This amount is multiplied by

100 to obtain the percentage of decrease in capacity. A value range of 0-0.33 indicates low incapacity, 0.34-0.66 indicates mild incapacity and 0.67-1.0, severe incapacity[9].

The translation and cross-cultural adaptation procedure was adapted from an internationally accepted protocol proposed by the International Quality of Life Assessment Project[12,13]. The technique used was back translation associated with the bilingual method, as carried out in other similar studies[14]. The stages adapted from the protocol and conducted in the present study will be described below.

First, two bilingual teachers, who were aware of the objective of the research, translated the questionnaire seeking a semantic and conceptual content equivalence with the original version. This was the first Brazilian Portuguese version of the original questionnaire which was then sent to a bilingual collaborator (Brazilian Portuguese/English) with no previous knowledge about the material to be back translated. With the new English version of the questionnaire, the bilingual teachers who participated in the first phase of the study completed a meticulous comparative analysis between this new version and the original English version. After a consensus English version was reached and translated, we had the second version of the Portuguese questionnaire, ADLQ-translated version, which was used in the present study. For this, the translation of the original text was revised by the researcher of the Brazilian version of the original questionnaire and by two professionals with clinical experience in the area and familiar with the content. Their objective was to verify if the translation was adequate for the needs of the local population under study.

Pilot study

A pre-test was carried out to verify the cultural adequacy of the instrument, and the answer "I didn't understand the question" was added to all of the items. Data collection was conducted with six randomly selected caregivers, which corresponded to 10% of the sample. Pre-test data analysis showed that none of the items was above the 15th percentile of incomprehension, which attested to the instrument's adequacy with no need for changes to its content or a new pre-test.

Application of ADLQ - translated version

For the data collection, the researcher was submitted to training with in-depth theoretical and practical study of the application form of the ADLQ-translated version and the Mini-Mental State Examination (MMSE), which was also used in this study. The latter was used in the present study in order to evaluate the validity of the translated instrument in contrast with a widely accepted standard of cognitive evaluation, given the close association between cognitive levels and functional ability. The MMSE is also a strong predictor of physical incapacity and decline in the basic and instrumental ADLs. The application of these instruments was carried out by a single researcher. For the sample design, we elicited the cooperation of family members of the support group "Caring for caregivers", in the city of Natal, RN. Each individual was contacted personally or by phone by the researcher, who explained the study. If the caregiver met the inclusion criteria and agreed to take part in the study, the researcher scheduled a home visit to apply the questionnaires.

After signing a consent form on behalf of himself/herself and the patient, the primary caregiver was instructed to answer the ADLQ - translated version without researcher input. Each item had to be marked according to the patient's capacity to perform the activities at the time. During the same visit, the researcher applied the MMSE to the AD patient. The MMSE consists of several questions usually divided into 7 categories, each designed to assess specific cognitive "functions": *time orientation* (5 points), *place orientation* (5 points), *registration of three words* (3 points), *calculation or attention* (5 points), *recall of the three words* (3 points), *language* (8 points) and *visual constructive capacity* (1 point). The MMSE score can vary from a minimum of 0 to a maximum total of 30 points. The scale was translated by Bertolucci (1994) and validated for use in Brazil[15].

Data analysis

The software SPSS version 15.0 was used to process the data. The properties related to instrument validity were evaluated with the purpose of determining whether the cross-cultural adaptation was in agreement with the established psychometric standards. The measurements performed are described below.

The psychometric analysis of the instrument consisted of three types of validity analysis and the reliability analysis of the questionnaire. The validity types conducted were criterion-related validity, content validity and construct validity. Criterion-related validity consists of the relationship between the outcome of a measurement and a widely accepted standard or criterion[16]. In content validity analysis, the items of the instrument are analyzed to determine whether they fit the instrument's objectives. A systematic exam of the questionnaire content was conducted in order to assure its representativeness, i.e. that all the fundamental aspects of the evaluation were covered[16,17]. Construct validity is considered the most fundamental form of instrument validity and constitutes a direct form of verifying the legitimacy hypothesis of the latent trait representation[18,19]. To assess this type of validity, multitrait-multimethod matrices were used to identify the consistency of the instrument's inter-item correlation through the Spearman correlation test. Based on the internal consistency analysis, i.e. on the correlation between each item and the other items, a new, condensed measurement instrument was proposed,

which consisted of the variables that had significant correlations with the MMSE instrument used as reference.

Thus, we developed a shorter version of the instrument, entitled ADLQ-Brazilian version, based on the variables which had significant correlations with the MMSE total score. After that, the Kolmogorov-Smirnov test was used to verify the normality of the data for the total scores of ADLQ, ADLQ-Brazilian version and MMSE. The Pearson correlation test was used to verify the association between the scores of the assessed instruments. The paired *t* test was used to verify the equality of the means between the variables ADLQ and ADLQ-Brazilian version. Finally, to identify the factorial structure of the functional capacity indicators of the new instrument, the data were submitted to multivariate analysis by factorial analysis.

Before the factorial analysis, the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was taken in consideration, as was the Bartlett Test of Sphericity (BTS) which verifies the hypothesis that there is no correlation between the assessed variables. The number of factors was chosen based on the Kaiser criterion, in which only those factors with autovalues higher than one are considered. Varimax rotation was used to identify the factorial structure of the functional capacity indicators with the intention of grouping the correlated variables. The reliability of the new instrument was evaluated using Cronbach's alpha coefficient, which reflects the degree of covariance among the items and serves as an indicator of the internal consistency of the questionnaire because it measures the impact of variability when certain items are removed.

Results

Development of the translated version and cross-cultural adaptation of the ADLQ

The translation and back-translation process of the questionnaire associated with the bilingual method showed satisfactory results. This indicates equivalence and reconciliation of the translated items, semantic equivalence between the two translations and absence of translation difficulties. The qualitative item analysis by the researcher and the two professionals with clinical experience in the area, the pre-test, the cross-cultural adaptation to the studied population and the subsequent refinement of the instrument assured an appropriate form and vocabulary for the purpose of this study.

The application of the ADLQ-Brazilian version to the studied population allowed the characterization of the sample, as shown in Tables 1 and 2; the mean age was 81.7 years (±7.245). Based on the translation of the ADLQ instrument into Brazilian Portuguese, it was necessary to analyze its psychometric properties to develop appropriate functional dependence measurements for the Brazilian population. The mean application time of the instrument was 20 minutes.

Analysis of the psychometric properties

Criterion-related validity of the ADLQ-translated version

We chose the MMSE to analyze the validity of the translated instrument compared to an accepted parameter of cognitive assessment. The results showed an inversely significant correlation (-0.793) at the 5% level between the instruments used in the data collection, which explains the 62% total variance. Table 3 shows the mean score obtained in MMSE as well as in the ADLQ-translated version.

Content validity

The content validity of the instrument was satisfactory because its items take into consideration the main aspects which represent the construct of functional capacity through basic and instrumental ADLs. In addition, the pre-test, the cross-cultural adaptation to the studied population and the refinement of the instrument, carried out by the researcher as well as by two professionals with clinical experience in the area, reinforce the appropriate form and vocabulary for measurement purposes.

Construct validity

The inter-item correlation matrices showed that some items correlated with the overall measurements of functional capacity in a slightly positive and significant manner ($p<0.05$). In general, these measurements of overall functional capacity showed higher correlations with the questions about self-care and lower correlations with the questions about household care, as well as with items of work/recreation and travel. The inter-item correlation matrices also showed that the highest correlations occurred between items of the same dimension of functional capacity, mainly the items related to self-care.

Table 4 shows the subsequent correlation between the internal items of the ADLQ-translated version and the MMSE. The purpose of this analysis was to test the internal coherence of the evaluated instrument with a widely accepted instrument in healthcare units. The variables significantly correlated with the MMSE were selected in order to propose a more condensed instrument called ADLQ-Brazilian version. The correlation between the ADLQ-translated version and the ADLQ-Brazilian version was 0.818, with a statistical significance of 5%. This result explains the total variance of approximately 67%. Through the *t* test for correlated samples, the means of the ADLQ-translated version and ADLQ-Brazilian version did not

differ statistically at the 5% level. Therefore, the simplification of the instrument did not change the mean level of functional dependence, making the instrument appropriate for use.

In order to identify factors that explain the chosen variables according to the previously mentioned criteria, we used factorial analysis (varimax rotation) as a multivariate data analysis technique. Before that, however, the measure of sampling adequacy (KMO) was taken into account, as was the BTS test that examines the hypothesis that there is no correlation between the assessed variables. These results were significant at the 5% level, indicating an appropriate acceptance of the data to the factorial analysis and the existence of correlation between the variables. According to the hypotheses shown, a representation was prepared containing six factors that explained the seventeen variables previously selected.

The number of factors was chosen based on the Kaiser criterion, which only considers factors with autovalues higher than one. The six resulting factors correspond to approximately 71% of the total autovalue of the model, i.e. together these factors explain 71% of variations of the original measurements. The extracted components, the variation explained by each factor and the accumulated variation are shown in Table 5. It is also possible to observe in Table 6 that, after varimax rotation, the seventeen items selected from the resulting dimensions were grouped between the correlated variables. The result suggests a new restructuring of the instrument. The first domain retained four items related to self-care (getting dressed, bathing, physiological needs and grooming). The second domain retained three items with aspects related to communication (walking around the neighborhood, talking and comprehension). The third domain retained factors related to intellectual activity (reading and writing), the fourth domain concentrated aspects related to organization/planning (traveling to unknown places, managing finances, using the phone). Finally, the fifth domain retained items related to shopping/money (participation in groups, shopping, handling cash), while the sixth and last domain retained activities related to food (eating, taking pills or medicines). The reliability of the new suggested instrument

Table 1. Characteristics of patients with Alzheimer's disease who participate in a support group in the city of Natal, RN (2007).

Variables	f	%
Sex		
Female	41	68.3
Male	19	31.7
Occupation		
Homemaker	24	40.0
Retired	13	21.7
Others	23	38.3
Educational Level		
Illiterate	6	10.0
Primary	27	45.0
Secondary	19	31.7
Tertiary	8	13.3
Resides with		
Spouse	24	34.3
Children	34	48.6
Professional caregiver	9	12.8
Others	3	4.3
Associated Diseases		
Hypertension	14	19.2
Diabetes	14	19.2
Osteoporosis	21	28.8
Others	8	10.9
None	16	21.9
Household income		
Minimum wage	8	13.4
3-6 times the minimum wage	20	33.3
7-10 times the minimum wage	20	33.3
More than 10 times the minimum wage	12	20.0

Table 2. Characteristics of the caregivers of patients with Alzheimer's disease who participate in a support group in the city of Natal, RN (2007).

Variables	f	%
Caregiver Educational Level		
Illiterate	0	0.0
Primary	11	18.3
Secondary	28	46.7
Tertiary	21	35.0
Professional caregiver		
Spouse	9	11.7
Children	34	44.1
Professional caregiver	32	41.6
Other family members	2	2.6
Number of caregivers		
Only one	19	31.7
Two	25	41.6
Three or more	16	26.7

Table 3. MMSE and ADLQ variables for patients with Alzheimer's disease who participate in a support group in the city of Natal, RN (2007).

Variables	Valid Cases	Minimum Value	Maximum Value	Mean	Standard Deviation
Time Orientation	60	0	5	0.9	1.439
Place Orientation	60	0	5	1.7	1.846
Registration	60	0	3	2.1	1.329
Calculation or Attention	60	0	5	0.8	1.508
Recall	60	0	2	0.2	0.504
Language	60	0	9	4.2	3.026
Gross MMSE Value	60	0	27	9.9	7.740
Degree of Functional Dependence (ADLQ-translated version)	60	0.4	1.0	0.8	0.156

Table 4. Correlation between the internal items and the total ADLQ score for the patients with Alzheimer's disease who participate in a support group in the city of Natal, RN (2007).

Domain	Variable	ADLQ-translated version		Total Categorized MMSE	
		r	p-value	r	p-value
Self-care	Eating	0.456 **	0.000	-0.592**	0.000
	Getting dressed	0.602 **	0.000	-0.528**	0.000
	Bathing	0.574 **	0.000	-0.486**	0.000
	Physiological needs	0.619 **	0.000	-0.688**	0.000
	Taking pills or medication	0.488**	0.000	-0.291*	0.024
	Grooming	0.305*	0.018	-0.463**	0.000
Household Care	Preparing meals	0.143	0.276	-0.117	0.375
	Setting the table	0.028	0.833	-0.143	0.275
	Tidying the house	-0.132	0.315	0.141	0.281
	Performing household maintenance	0.029	0.826	0.002	0.987
	Performing household repairs	-0.076	0.562	-0.050	0.704
	Doing laundry	-0.083	0.530	0.217	0.096
Work/Recreation	At work	0.047	0.723	-0.144	0.273
	Recreational activities	0.120	0.362	-0.071	0.592
	Group participation	0.213	0.102	-0.278*	0.031
	Going out	0.336**	0.009	-0.247	0.057
Shopping/ Money	Shopping	0.499**	0.000	-0.404**	0.001
	Handling money	0.596**	0.000	-0.550**	0.000
	Managing finances	0.292*	0.024	-0.323*	0.012
Travel	Using public transport	0.199	0.128	-0.127	0.335
	Driving	0.123	0.349	-0.052	0.691
	Walking around the neighborhood	0.316*	0.014	-0.277*	0.032
	Traveling to unknown places	0.396**	0.002	-0.266*	0.040
Communication	Using the telephone	0.485**	0.000	-0.480**	0.000
	Talking	0.367*	0.004	-0.526**	0.000
	Comprehension	0.511**	0.000	-0.597**	0.000
	Reading	0.326*	0.011	-0.436**	0.000
	Writing	0.360**	0.005	-0.470**	0.000

Spearman correlation (r). * p<0.05; * * p<0.01. Research data.

was calculated by Cronbach's alpha, whose value corresponded to 0.759. The value for Cronbach's total alpha and for all of the seventeen selected items were acceptable, thus it can be considered that the internal consistency was satisfactory. Analysis of the scale mean showed that the higher contribution came from the variables Eating and Physiological Needs, which have items of higher relevance for the model.

Discussion

Development of the ADLQ-translated version and cross-cultural adaptation

The new therapeutic strategies which have arisen for the treatment of dementia, especially AD, not only delay the progression of the disease and improve quality of life but also encourage the search for assessment instruments that allow a more precise identification of cases of cognitive and functional dependence. However, most of the available scales for the assessment of dementia have serious limitations due to low sensibility and specificity, prolonged application time and complexity, which make them inappropriate for patients with deteriorated cognition[20,21]. In the present study, the objective of translating the ADLQ into Brazilian Portuguese and its cross-cultural adaptation[9] to the Brazilian population was reached. Each question had five answer choices, and the respondents no difficulty understanding and answering them according to the patient's clinical condition.

The lack of standardization in the methodology used for the translation and adaptation process in most of the research instruments hampers comparisons with similar studies. The translations should be mainly evaluated in terms of conceptual equivalence so that necessary grammatical changes can be conceptually similar to another culture. With regard to the cross-cultural adaptation, cultural factors such as habits and activities of a population should be considered because an activity which is not common in a certain population can make the instrument's adaptation invalid[22,23]. In the present study, no impediments were found either in the Brazilian Portuguese language or in the cultural aspects which could render unviable

the applicability of the translation and the cross-cultural adaptation of the analyzed instrument.

Analysis of the psychometric properties

Criterion-related validity of the ADLQ-translated version

The results between the MMSE and the functional dependence level measured by the ALQ-translated version showed that the lower the MMSE gross value, the higher the functional dependence. These results show a significant negative correlation between the two instruments, which reinforces the strong association between cognitive levels and functional ability[24,25]. It also suggests that dementia works as a strong predictor of physical incapacity and of decline in basic and instrumental ADLs[26].

Content validity

The content validity of the instrument was satisfactory. The original text translation was revised by the researcher and by two professional physical therapists with clinical experience in the area, familiar with the context of the evaluated instrument. The objective was to determine whether the translation was adapted to the local population under study. The analysis of the instrument showed that all items took into consideration the main aspects of the construct of functional capacity through the basic and instrumental ADLs. Each question had answer choices that were easy to understand and consistent with the evaluated function .

Construct validity

The results of the psychometric property analysis of the ADLQ-translated version suggest a new functional capacity assessment instrument for use in clinical practice. The important relationship between functional capacity and cognitive deficit shows that cognitive impairment, measured by the MMSE, is the main clinical complaint of patients with AD and it directly affects functional capacity, which was measured by the ADLQ-translated version. The items of the ADLQ- translated version which had significant correlation with the MMSE include basic and instrumental ADLs; therefore, it is important that an instrument include the evaluation of both kinds of activities. Some studies have shown that changes in ADL performance can occur at the initial stages of the disease. It has been suggested that there is a relationship between the severity of cognitive impairments and the functional performance; initially the losses are observed in IADLs and basic ADLs are only damaged in more advanced stages of dementia[10]. Based on the statistical analysis observed in the results, the items of the new instrument (ADLQ-Brazilian version) were distributed into six domains, encompassing relevant basic and instrumental ADLs usually affected during the process of the disease, which are important to the functional assessment[7]. These activities are: eating, getting dressed, bathing, physiological needs, taking pills, participating in group activities, managing finances, handling money, walking around the neighborhood, using the telephone, comprehension, etc., which are important enough to predict the degree of functional impairment.

It was also possible to observe in the new suggested instrument that the questions which were not correlated with MMSE included activities not normally performed by both genders in the Brazilian society. The questions related to household care (such as preparing meals, setting the table, cleaning the house,

Table 5. Determining the number of factors to be derived for the data of patients with Alzheimer's disease who participate in the support group "Caring for caregivers" in the city of Natal, RN (2007).

Factor	Autovalue	% of variants	Accumulated %
1	3.053	17.958	17.958
2	2.337	13.748	31.706
3	1.728	10.166	41.872
4	1.670	9.825	51.697
5	1.648	9.694	61.391
6	1.637	9.627	71.018

KMO=0.667. Significance of BTS test=0.000.

Table 6. Varimax rotation of the matrix of ADLQ components for the data of patients with Alzheimer's disease who participate in the support group "Caring for caregivers" in the city of Natal, RN (2007).

Item	Components					
	1	2	3	4	5	6
Eating						0.648*
Getting dressed	0.857*					
Bathing	0.832*					
Physiological Needs	0.729*					
Taking pills or medication						0.885*
Grooming	0.427*					
Group participation					0.775*	
Shopping					0.669*	
Handling money					0.463*	
Managing finances				0.419*		
Walking around the neighborhood		0.756*				
Traveling to unknown places				0.876*		
Using the telephone				0.752*		
Talking		0.861*				
Comprehension		0.766*				
Reading			0.866*			
Writing			0.741*			

Extraction method: Principle Component Analysis. Rotation Method: Varimax with Kaiser Normalization. *Associated with the corresponding factor.

washing clothes, etc.) are usually performed by females and did not correlate with the MMSE, while the items related to household maintenance and repair are usually performed by males. The other items that did not have a significant correlation with the MMSE were mostly from the IADL group (driving, using public transportation, going out, working, recreational activities). These items are not performed frequently by the older adults of this study ("I have never performed this activity"); thus, they were not relevant to the measurement of functional impairment of the evaluated subjects because they had ceased before the onset of the disease.

AD is characterized by the impairment of at least one cognitive function in addition to memory. The earliest affected functions are the executive functions, language and selective and divided attention. Therefore, the performance of ADLs is affected either by forgetfulness or by performance deficit[27]. Researchers suggest that a combination of an ADL functional assessment scale and a cognitive test would be useful in individuals with suspected dementia and would consequently increase the sensibility and specificity to investigate the disease in such a heterogeneous population from a cultural and socioeconomic point of view[28]. It is clear, therefore, that the simple measurement of cognitive performance through scales can have several limitations. Some scales were developed with the specific purpose of investigating the severity of dementia based on the patient's cognitive and functional capacity [14]. Thus, the combination of a cognitive test and functional assessment questionnaires applied to an informant can improve the detection of dementia[27,29]. The ADLQ-Brazilian version (Appendix 1) proposed here includes ADLs in which important affected cognitive functions are considered. The instrument showed good reliability, as shown by Cronbach's alpha coefficient (0.759), which can vary from 0 to 1.0 with 0 to 0.6 indicating unsatisfactory reliability, 0.6 to 0.7, satisfactory reliability and 0.7 to 1.0, high reliability[30].

Finally, the present study on the translation and cross-cultural adaptation process introduces a practical and condensed functional assessment tool for use in research. It also considers important aspects of ADLs which could contribute to a better measurement of the patient's functional status by all healthcare professionals. This is especially true for physical therapists and for the selection of an appropriate treatment[31].

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Appendix 1: ADLQ - Brazilian version.

Instruções: Circule um número por cada item

1. ATIVIDADES DE AUTOCUIDADO

Ao vestir-se
0 = Nenhum problema
1 = Independente, porém de forma lenta ou desajeitada.
2 = Sequência errada, com o esquecimento de itens.
3 = Precisa de ajuda para se vestir.
9 = Não sei.

No Banho
0 = Nenhum problema.
1 = Toma banho sozinho, mas precisa ser lembrado.
2 = Toma banho com ajuda.
3 = O banho deve ser dado por outras pessoas.
9 = Não sei.

Necessidades Fisiológicas
0 = Vai ao banheiro sozinho.
1 = Vai ao banheiro quando é lembrado; alguns acidentes.
2 = Precisa de ajuda ao fazer suas necessidades fisiológicas.
3 = Não possui nenhum controle sobre suas necessidades fisiológicas.
9 = Não sei.

Preocupação com aparência pessoal:
0 = A mesma de sempre.
1 = Preocupa-se somente ao sair.
2 = Deixa que outros lhe arrumem ou faz o mesmo se for solicitado.
3 = Resiste aos esforços do responsável ao tentar limpá-lo e arrumá-lo.
9 = Não sei.

2. INTERAÇÃO

Ao se locomover pela vizinhança
0 = O mesmo de sempre.
1 = Sai com menos frequência.
2 = Já se perdeu perto de casa.
3 = Não sai mais desacompanhado.
9 = Esta atividade foi restrita no passado ou Não sei.

Compreensão
0 = Entende tudo que é dito, como sempre.
1 = Pede para repetir.
2 = Ocasionalmente, apresenta dificuldades para entender conversações ou palavras específicas.
3 = Não entende o que as pessoas estão dizendo, na maior parte do tempo.
9 = Não sei.

Ao conversar
0 = O mesmo de sempre.
1 = Conversa menos; apresenta dificuldades para lembrar de palavras ou nomes.
2 = Ocasionalmente, ao falar, comete erros.
3 = Sua fala é quase incompreensível.
9 = Não sei.

3. ATIVIDADE INTELECTIVA

Ao ler
0 = O mesmo de sempre.
1 = Lê menos frequentemente
2 = Apresenta dificuldades para entender ou lembrar o que leu.
3 = Não lê mais.
9 = Nunca leu OU Não sei.

Ao escrever
0 = O mesmo de sempre
1 = Escreve com menos frequência; ou comete alguns erros.
2 = Apenas assina seu nome.
3 = Nunca escreve.
9 = Nunca escreveu muito OU Não sei.

4. ORGANIZAÇÃO E PLANEJAMENTO

Ao viajar para lugares desconhecidos
0 = O mesmo de sempre.
1 = Ocasionalmente fica desorientado em ambientes desconhecidos.
2 = Fica muito desorientado, mas enfrenta a situação, se acompanhado.
3 = Não consegue mais viajar.
9 = Nunca praticou esta atividade OU Não sei.

Ao administrar as finanças
0 = Nenhum problema em pagar contas e ir ao banco.
1 = Paga as contas com atraso, apresenta dificuldades no preenchimento de cheques.
2 = Esquece de pagar contas; dificuldades ao administrar a conta bancária; precisa da ajuda de outros.
3 = Não mais administra as finanças.
9 = Nunca foi responsável por esta atividade OU Não sei.

Ao usar o telefone
0 = O mesmo de sempre.
1 = Liga para alguns números de telefones conhecidos.
2 = Apenas atende o telefone (não faz ligações).
3 = Não faz uso do telefone.
9 = Nunca teve telefone OU Não sei.

5. PARTICIPAÇÃO SOCIAL

Participação em grupos
0 = Comparece às reuniões e assume responsabilidades de forma usual.
1 = Comparece às reuniões com menos frequência.
2 = Comparece ocasionalmente; não tem nenhuma responsabilidade importante.
3 = Não comparece mais.
9 = Nunca participou de grupos OU Não sei.

Ao manusear dinheiro
0 = Nenhum problema.
1 = Dificuldade em pagar a quantia certa e em contar dinheiro.
2 = Perde ou esquece onde coloca o dinheiro.
3 = Não mais manuseia dinheiro.
9 = Nunca foi responsável por esta atividade OU Não sei.

Ao fazer compras
0 = Nenhum problema.
1 = Esquece de comprar itens ou compra itens não necessários.
2 = Precisa estar acompanhado ao fazer compras.
3 = Não mais realiza esta atividade.
9 = Nunca foi responsável por esta atividade OU Não sei.

6. ALIMENTAÇÃO

Ao comer
0 = Nenhum problema
1 = Independente, porém de forma lenta ou com alguns derramamentos.
2 = Necessita de ajuda para cortar ou despejar líquidos; derrama frequentemente.
3 = Com a maioria dos alimentos, não consegue se alimentar sozinho.
9 = Não sei.

Ao tomar comprimidos ou remédios
0 = Lembra sem ajuda.
1 = Lembra, se sempre for guardado num lugar específico.
2 = Precisa de lembretes orais ou escritos.
3 = Os remédios devem ser administrados por outros.
9 = Não toma comprimidos ou remédios de forma regular OU Não sei.