Cross-cultural Adaptation, Reliability and Validity of the DAFS-R in a Sample of Brazilian Older Adults

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Abstract

The Direct Assessment of Functional Status-Revised (DAFS-R) is an instrument developed to objectively measure functional capacities required for independent living. The objective of this study was to translate and culturally adapt the DAFS-R for Brazilian Portuguese (DAFS-BR) and to evaluate its reliability and validity. The DAFS-BR was administered to 89 older patients classified previously as normal controls, mild cognitive impairment (MCI) and Alzheimer’s disease (AD). The results indicated good internal consistency (Cronbach’s α = 0.78) in the total sample. The DAFS-BR showed high interobserver reliability (0.996; p < .001) as well as test–retest stability over 1-week interval (0.995; p < .001). Correlation between the DAFS-BR total score and the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE) was moderate and significant (r = −.65, p < .001) in the total sample, whereas it did not reach statistical significance within each diagnostic group. Receiver operating characteristic curve analyses suggested that DAFS-BR has good sensitivity and specificity to identify MCI and AD. Results suggest that DAFS-BR can document degrees of severity of functional impairment among Brazilian older adults.

Keywords: Functional status; Cross-cultural adaptation; Alzheimer’s disease, MCI, reliability; Validity

Introduction

Functional impairment is part of the criteria for the diagnosis of dementia syndromes. According to different international criteria available for the diagnosis of dementia, documentation of functional decline based on subjective or objective assessment is required. Assessing functionality is also important to determine the level of assistance and supervision necessary for the patient to continue to perform activities in his/her environment. More recently, with the growing interest in the detection of preclinical dementia and the diagnosis of Mild Cognitive Impairment (MCI; Petersen et al., 1999), the establishment of intact functioning has become even more relevant.

Most instruments used to assess functional status of older adults in clinical and research settings focus on information given by a family member or caregiver. These measurements can under- or overestimate functional decline because they are susceptible to potential reporter biases such as mood, personality, or burnout (Loewenstein et al., 2001; Onor, Trevisiol, Negro, & Aguglia, 2006; Tierney, Szalai, Snow, & Fisher, 1996). Therefore, family members’ and nursing staff’s perceptions may be incongruent in the estimation of the patients’ true abilities (Lukovitz & McDaniel, 1992). An alternative way to assess functioning in everyday life is to obtain objective information using performance-based tests.

The Direct Assessment of Functional Status-Revised (DAFS-R) for older adults is an instrument developed to directly evaluate a broad array of functional capacities required for independent living in older patients with and without cognitive impairment. DAFS-R significantly discriminated patients with Alzheimer’s disease (AD) from normal elderly and from a
group of elderly outpatients with major depression (Loewenstein et al., 1989). In this article, the authors demonstrated that DAFS-R is strongly associated with functional measures, based on caregivers’ reports, and it can adequately discriminate patients who are perceived by clinicians and family members as having deficits in five instrumental activities of daily living (driving, telling time, remembering lists, and basic and complex financial tasks) from those who do not show such deficits. It was also sensitive to functional decline after 1 year, and it was useful to establish longitudinal patterns of deterioration (Loewenstein et al., 1995).

The American version of DAFS-R objectively tests seven domains: Time Orientation, Communication skills, Dealing with Finances, Shopping skills, Grooming skills, Eating skills, and Driving skills. Reliability, convergent, and discriminative validity have been established by Loewenstein and associates (Loewenstein et al., 1989; Loewenstein & Bates, 2006), in English-speaking populations. The scale has also been translated into six different languages and has had its validity tested in different cultures.

Similar functional assessment tools have been developed by occupational therapists, with published manuals and research evidence on such instruments (Brown, 2009). The Bay Area Functional Performance Evaluation, for instance, uses tasks to determine a patient’s ability to participate in goal-directed activity and to demonstrate appropriate behaviors (Houston, Williams, Bloomer, & Mann, 1989). Another similar assessment is the performance assessment of self-care skills (Holm & Rogers, 2008), a performance-based observational tool which consists of 26 tasks, 5 functional mobility tasks, 3 personal self-care tasks, and 18 instrumental activities of daily living. However, some of these standardized measures are not direct or observational, and they are used more frequently for treatment planning purposes (Hammond, 1996). A variety of performance-based measures of functional living skills are available in the literature, and readers may refer to recent reviews (Desai et al., 2004; Moore, Palmer, Patterson, & Jeste, 2007). In Brazil, there is a lack of direct functional assessment instruments translated and adapted to Brazilian Portuguese (Tedesco, 2002).

Dementia diagnosis relies on information regarding functional status, and performance-based instruments may generate evidence which might be closer to everyday performance. The objective of the present study was to advance current knowledge about objective functional measures and to contribute to better diagnostic practices in geriatric care. This study was conducted in order to culturally adapt DAFS-R to Brazilian culture and to evaluate its psychometric properties in a population of older adults with heterogeneous degrees of cognitive and functional impairment.

DAFS-R was selected for validation because of its well-documented association with everyday performance, the relevance of the functional domains it examines, and because its application is feasible in clinical and research settings.

Specifically, convergent validity was calculated by measuring the agreement between objective and subjective assessments of functional status. Reliability was assessed by calculating internal consistency among all items of the scale and among its subdomains, and it was also evaluated through test–retest stability in 1 week and the measurement of inter-rater agreement. Finally, we aimed to verify whether this instrument could assess different degrees of functional impairment associated with MCI and AD, as an additional way of evaluating the validity of DAFS-BR.

Materials and Methods

Participants and Procedures

Eighty-nine older adults were selected to participate (32 cognitively unimpaired, 31 patients with MCI, and 26 with AD). These individuals are participants in a prospective study on cognitive aging and AD, in course at a university-based memory clinic. They were recruited from community sources, including patients with spontaneous demand for assessment due to memory complaints, invitation of community-dwelling elderly patients through radio advertisements, and referral from other clinics for the assessment of suspected cognitive decline. All patients undergo regular clinical and neuropsychological evaluations and have been diagnosed by a team of psychiatrists, neuropsychologists, and geriatricians in consensus meetings as: AD, MCI, and normal controls (NC). Dementia was diagnosed accordingly to the DSM-IV criteria (American Psychiatric Association, 1994); AD was diagnosed according to the NINCDS-ADRDA criteria (McKhaan et al., 1984). Diagnosis of MCI was made according to Petersen’s criteria (Petersen et al., 1999). Potential participants with other neurological or psychiatric disorders, other types of dementia, or clinically significant medical conditions (cardiovascular disease, diabetes and hypertension not adequately compensated by medication, and severe sensory limitations) were excluded from the study and referred to other clinics. This research project was completed in accordance with the Helsinki declaration, and it was approved by the hospital ethical committee, and all participants signed the approved informed consent form. The sample included in the present study was randomly selected within each diagnostic group, and study participants were being followed-up regularly at the memory clinic.
Mental state examination was performed with the Brazilian version of the Cambridge Examination for Mental Disorders in the Elderly (CAMDEX) semi-structured interview (Bottino et al., 1999; Roth et al., 1986; Nunes et al., 2008), which yields the scores for the Cambridge Cognitive Test (CAMCOG), the Abbreviated Mental Test (Roth & Hopkins, 1953), the Mini-Mental State Examination (MMSE; Brucki, Nitrini, Caramelli, Bertolucci, & Okamoto 2003; Folstein, Folstein, & McHugh, 1975), and the Hachinski Ischemic Score (Graham et al., 1997). The Clock Drawing Test, which is part of the CAMCOG schedule, was additionally scored accordingly to Sunderland’s criteria (Sunderland, Hill, & Mellow, 1989). The 21-item Hamilton Depression Scale (HAM-D) (Hamilton, 1960) was administered to rule out depressive symptomatology.

A complete neuropsychological examination was conducted by trained psychologists and the results were used for diagnostic purposes. A description of this protocol may be found in previous studies describing this sample (Diniz et al., 2008; Nunes et al., 2008; Pereira, Yassuda, Oliveira, & Forlenza, 2008). Clinical assessment (including the application of the CAMCOG and HAM-D) and neuropsychological testing occurred on two separate days and each lasted approximately 90 min. DAFS-BR was completed on a third consecutive visit.

Assessment of Functional Status

DAFS-R assesses seven different domains of functional abilities by requiring the participant to carry out different tasks. The domains are: (1) Time Orientation—orientation to time and the ability to tell time; (2) Communication skills—ability to use the telephone and prepare a letter for mailing; (3) Dealing with Finances—identify and count currency, write a check, balance a checkbook, and make change for a purchase; (4) Shopping skills—shopping from memory—verbal recall of 6 grocery items from memory, selection of the six items from a total of 21 items, and selection of other 4 items using a written list; (5) Grooming skills—ability to remove the top of a toothpaste tube; put the toothpaste on the toothbrush, turn the water on and off, brush teeth, wash hands, and comb hair; (6) Eating skills—demonstrate the motor activity involved in cutting a steak, taking a bite of the steak, eating a soup, pouring water into the glass from the pitcher; and drinking water; and (7) Driving skills—identifying the meaning of road signs.

The six domains have varying numbers of items differing, therefore, in score range—“Time Orientation,” 16 points; “Communication skills,” 15 points; “Dealing with Finances,” 32 points; “Shopping skills,” 20 points; “Grooming skills,” 13 points; and “Eating skills,” 10 points. Administration of this test requires approximately 25 min for each subject (Loewenstein & Bates, 2006; Loewenstein et al., 1989). When a patient performs a particular subtest incorrectly, he/she fails to get that point, and the rater should not provide a new trial for the subtest. A spontaneous incorrect response after a correct response results in an incorrect score for that subtest. Because this is a test of functional capacity, the rater assesses what the patient can actually do on his/her own.

The professionals who administered the DAFS-BR were not aware of the diagnostic status, and the scores on this assessment were not taken into account to reach consensus diagnoses.

For the calculation of inter-rater agreement, 19 individuals of this sample completed the instrument twice in the same day conducted by two different examiners, one neuropsychologist and one occupational therapist, to evaluate whether different testers could reproduce application and scoring procedures. For the calculation of stability over time, these participants completed a third evaluation 1 week later with the same neuropsychologist. Subjective evaluations of functional impairment were carried out with 73 informants (family members or caregivers) who completed the Informant Questionnaire of Cognitive Disorders of the Elderly (IQCODE). There were missing data for the IQCODE for 16 patients, because the informants were not present in the moment of the evaluation.

The IQCODE is an informant-based questionnaire that can be filled out by a relative, close friend or caregiver (the informant) to determine whether that person has declined in cognitive functioning. The IQCODE has 86% sensitivity and 80% specificity to indentify patients with dementia. This scale compares the patient’s present ability to perform several activities of daily living and tasks that demand intact recent episodic memory and intellectual abilities over a continuum of 10 years. It is composed of 26 items individually scored from 1 (“much better”) to 5 (“much worse”). Intermediate scores of 2 and 4 indicate slightly better or worse, respectively; score of 3 indicates no significant changes in comparison with 10 years ago. The final score is given by the sum of the 26-item scores divided by 26, and it ranges from 1 to 5, with higher scores indicating worse functional status. The IQCODE has been shown to have good sensitivity and specificity to identify cases of dementia (Abreu, Nunes, Diniz, & Forlenza, 2008; Jorm & Jacomb, 1989).

Translation and Cross-cultural Adaptation of DAFS-R

In the present study, the methodological steps recommended by internationally recognized publications for the cultural adaptation of psychometric instruments were followed (Guillemin, 1995). Permission to adapt the DAFS-R to Brazilian
Portuguese and to use it for research purposes was received from its authors. A multidisciplinary panel composed of geriatric psychiatrists and neuropsychologists was involved in the cultural adaptation.

The American version of DAFS-R was translated into Portuguese by two certified translators not affiliated with the study. After translation, these two versions were compared and adapted by the panel of specialists who created a single version in Brazilian Portuguese (version 1). Version 1 was then back translated by a third certified translator, not familiar with the study, to English which originated a new version in English (version 2). The original and version 2 were compared by the multidisciplinary panel and found to be equivalent, due to the fact that there were very few linguistic discrepancies between these two versions. Version 1 was then revised by the panel in order to adapt the scale stimuli taking into account Brazilian culture, generating the revised Brazilian version (version 3). All modifications made are reported in the Appendix. The authors attempted to maintain the Brazilian version as similar as possible to the American one, so that cognitive demands would remain comparable. In this regard, the authors decided to retain the original telephone numbers with seven digits instead of eight, as it is currently used in Brazil. The authors felt that in some domains maintaining task demands was more important than cultural adjustment.

Pilot testing was then carried out in a group of 10 randomly selected patients from the larger sample of the cognitive study. Problems related to task comprehension were not identified. Researchers soon realized that most participants in the sample had difficulties in interpreting road signs, because they never drove or had retired from the road for many years. This was true for a significant number of participants in the total study sample. On the basis of this information, version 3 was modified and the Driving skills subitem was excluded, generating the final version of DAFS-BR (version 4). The authors concluded that recognizing road signs was not relevant to understanding functionality among Brazilian seniors and that maintaining Driving skills would favor senior drivers.

Statistical Analysis

Statistical analyses used SPSS for WINDOWS, version 14.0 (SPSS Inc., Chicago, IL, USA). The means for sociodemographic and clinical variables for the three groups were compared by means of ANOVAs, and two-by-two comparisons were done with the post hoc Tukey tests. Parametric tests were used because all variables followed normal distribution. Internal consistency was calculated using Cronbach’s $\alpha$. Intraclass correlation coefficients (ICCs) were used to assess stability over time and reliability between observers. Spearman’s $p$ correlation was used to assess the association between the DAFS-BR and the IQCODE, due to a lack of normal distribution within diagnostic groups. Receiver operating characteristic (ROC) curves were used to estimate the best DAFS-BR cut-off scores to discriminate diagnostic groups, considering consensus diagnosis as the gold standard. The critical $p$-value for statistical significance was set at $p = .05$.

Results

Sociodemographic information about this sample has been presented in an earlier study (Pereira et al., 2008). The sample was predominantly women (75% of controls, 74% of MCI, and 58% of AD), with a mean age of 73.8 years (± 6.7) and mean years of education was 10.3 (± 6.0). AD patients were older than controls and MCI (77.9 ± 6.0, 71.6 ± 5.6, and 72.6 ± 7.0 years of age, respectively, $p = .001$), although the difference between the latter two groups was not significant ($p = .915$; post hoc Tukey test). The current sample did not comprise illiterates; although controls were slightly more educated than MCI and AD (13.2 ± 6.0, 8.5 ± 5.5, and 8.8 ± 5.5 years of formal schooling, $p = .002$), all subjects in the sample had attained at least elementary school.

Table 1 reports mean scores for cognitive and functional variables. Results indicate that the diagnostic groups were different for all instruments, with the exception of the MMSE, when NC and MCI had equivalent mean scores.

### Table 1. Mean test scores (SD) for NC and patients with MCI and AD

<table>
<thead>
<tr>
<th></th>
<th>NC ($n = 32$)</th>
<th>MCI ($n = 31$)</th>
<th>AD ($n = 26$)</th>
<th>$p$-value$^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAFS-BR (0–106)</td>
<td>98.0 (5.7)</td>
<td>87.6 (7.4)</td>
<td>61.4 (15.9)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>CAMCOG (0–107)</td>
<td>97.8 (5.7)</td>
<td>87.6 (9.2)</td>
<td>64.2 (17.5)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>MMSE (0–30)</td>
<td>28.8 (1.5)$^b$</td>
<td>27.3 (2.3)$^b$</td>
<td>19.5 (5.5)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>IQCODE (0–5)</td>
<td>3.1 (0.3)</td>
<td>3.4 (0.3)</td>
<td>3.8 (0.7)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Notes: NC = normal controls; MCI = Mild Cognitive Impairment; AD = Alzheimer’s disease; DAFS-BR = Direct Assessment of Functional Status-Brazilian version; CAMCOG = Cambridge Cognitive Examination; MMSE = Mini-Mental State Examination; IQCODE = Informant-based Questionnaire of Cognitive Decline; higher scores for IQCODE indicate worse performance.

$^a$One-way ANOVA.

$^b$Not significantly different upon the post hoc Tukey test.
Table 2 reports the mean scores for the DAFS-BR subitems. AD patients had significantly lower performance in Time Orientation and Communication skills when compared with MCI and NC participants. Dealing with Finances and Shopping skills differentiated the three groups. For Grooming and Eating skills, no significant differences were found among the three groups.

Interobserver reliability and test–retest stability over time were high for all six subdomains and for total scores, and they are presented in Table 3. For Grooming and Eating skills, test–retest agreement and interobserver agreement were 100%.

The instrument was found to have high internal consistency (Cronbach’s $\alpha = .78$). The evaluation of each subdomain revealed that Grooming and Eating skills had the lowest correlations with the other subdomains and the total score, probably due to the fact that the tasks involved in these domains are overlearned, performed automatically, and recruit limited cognitive skills. Removing the domain with the lowest correlation (Eating skills) improved internal consistency slightly (Cronbach’s $\alpha = .80$). The correlations for each subdomain and the total score were: Time Orientation, $r = .76$; Communication skills, $r = .79$; Dealing with Finances, $r = .91$; Shopping skills, $r = .87$; Grooming skills, $r = .47$; Eating skills, $r = .41$.

The evaluation of convergent validity was carried out by comparing scores for the DAFS-BR and the IQCODE. In the total sample, Pearson’s correlations indicated that DAFS-BR scores were moderately but significantly correlated with the IQCODE scores ($r = -.65, p < .001$). However, Spearman’s correlations (due to a lack of normal distribution within groups) were not significant when each diagnostic group was analyzed separately (for NC $\rho = -.25, p = .17$; MCI $\rho = -.32, p = .12$; and AD $\rho = -.39, p = .13$).

To evaluate the diagnostic accuracy of the DAFS-BR, ROC curve analyses were performed to compare pairs of diagnostic groups (NC × MCI and NC × DA). Results presented in Table 4 indicate that DAFS-BR has excellent accuracy to discriminate NC from AD and lower but still high sensitivity and specificity to separate MCI from NC (Figs. 1 and 2).

Table 3. Reliability scores for 19 patients in the DAFS-BR

<table>
<thead>
<tr>
<th>DAFS-BR subitems</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interobserver</td>
</tr>
<tr>
<td>Time Orientation</td>
<td>0.990</td>
</tr>
<tr>
<td>Communication skills</td>
<td>0.918</td>
</tr>
<tr>
<td>Dealing with Finances</td>
<td>0.984</td>
</tr>
<tr>
<td>Shopping skills</td>
<td>0.928</td>
</tr>
<tr>
<td>Grooming skills</td>
<td>1.000</td>
</tr>
<tr>
<td>Eating skills</td>
<td>1.000</td>
</tr>
<tr>
<td>Total DAFS-R</td>
<td>0.996</td>
</tr>
</tbody>
</table>

Notes: ICC = intraclass correlation coefficient; DAFS-BR = Direct Assessment of Functional Status-Brazilian version. For all subdomains, interobserver and test–retest reliability $p$-value was <.001.

Discussion

The purpose of this study was to translate and culturally adapt the revised version of the DAFS-R into Brazilian Portuguese (DAFS-BR) and to evaluate its reliability and validity, so that it can be used for the evaluation of functional performance in
Brazil. In clinical practice to date, available measures of functionality are based on reports offered by family members, caregivers, or patients.

Present results suggest that DAFS-BR maintains its original psychometric characteristics. Reliability measures indicated excellent stability for all subitems and for the total scores of DAFS-BR. In spite of the linguistic and cultural differences, ICCs were high and similar to those reported in the original study (\(\kappa\)-values for inter-rater agreement \(=\)0.90 and \(\kappa\)-values for test–retest stability over time \(=\)0.89; Loewenstein et al., 1989) and for the German version after cross-cultural adaptation (inter-rater agreement \(r = .97\); test–retest stability over time \(r = .98\); construct validity \(r = .86\); Hochrein et al., 1996). Additionally, internal consistency measures demonstrated that the subdomains seem to address the same underlying dimension.

### Table 4. Summary of the ROC analyses with cut-off scores for NC × AD and NC × MCI

<table>
<thead>
<tr>
<th></th>
<th>AUC</th>
<th>Cut-off</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NC × AD</td>
<td>0.998 ((p &lt; .001))</td>
<td>86</td>
<td>100</td>
<td>93.70</td>
</tr>
<tr>
<td>NC × MCI</td>
<td>0.868 ((p &lt; .001))</td>
<td>93</td>
<td>80.60</td>
<td>84.40</td>
</tr>
</tbody>
</table>

Notes: NC = normal controls; MCI = Mild Cognitive Impairment; AD = Alzheimer’s disease; AUC = area under curve.

![Fig. 1. ROC curve: DAFS-BR, considering NC and MCI groups.](image1)

![Fig. 2. ROC curve: DAFS-BR, considering NC and AD groups.](image2)
The present study is also one of the few available in the literature to compare AD, MCI, and NC on objective measures of functional status (Pereira et al., 2008; Wadley, Okonkwo, Crowe, & Ross-Meadows, 2008). On a related note, Griffith and colleagues (2003) also assessed financial capacity in patients with MCI using a direct approach and found that this group demonstrates impairment across a range of financial abilities. Other authors have also suggested that diagnostic criteria for MCI should specify mild functional deficits due to the imprecision observed during the execution of complex tasks (Giovannetti et al., 2008). Older adults diagnosed with MCI may show subtle impairment in aspects of functionality which require complex cognitive processing, such as in DAFS-BR Dealing with Finances and Shopping skills. Previous studies have documented that memory and executive functions play an important role in instrumental activities of daily living (e.g., Schmitter-Edgecombe, Woo, & Greeley, 2009). Therefore, it is plausible that MCI patients present subtle functional limitations due to cognitive deficits. Present results also suggest that some DAFS-BR subdomains seem more sensitive to cognitive decline.

The evaluation of convergent validity revealed a statistically significant correlation between the DAFS-BR and the IQCODE for the total sample. Yet, within diagnostic groups, correlations were not significant. This result seems to suggest that there may be a fair amount of disagreement between objective and subjective evaluations of functionality, and the level of agreement may be influenced by the degree of cognitive impairment. Disagreement between the two instruments is higher when cognitively unimpaired older adults are evaluated on functional status, perhaps because subtle changes in functional status may not be easily observed; yet, they may be captured by objective measures. Additionally, disagreement between the two scales may also be associated with the many biases that are present in subjective evaluations of functionality, as indicated previously. An alternative explanation for this finding is that there may be restriction of range in DAFS-BR scores among NC and MCI participants, since ceiling effects might have occurred for some patients.

Previous studies have also demonstrated possible incongruence between objective and subjective measures of functional status (Loewenstein et al., 2001; Onor et al., 2006; Tierney et al., 1996). Allaire, Gamaldo, Ayotte, Sims, and Whitfield (2009), for instance, did not find significant differences between elderly subjects with and without MCI, when the assessment was based on the subjective appraisal of informants; however, they found significant differences between MCI and controls in objective measurements of the ability to deal with medication, finances, nutrition, and food preparation. Decreased correlations may also be related to the fact that DAFS-BR and IQCODE partially investigate different domains, with the former including physical and motor tasks and the latter having a stronger emphasis on cognitive performance.

Accuracy analyses suggested that DAFS-BR may help to discriminate patients with MCI and dementia from healthy older adults. Therefore, DAFS-BR should be of great value for the assessment of functional status of patients whose first language is Brazilian Portuguese. In particular, DAFS-BR may assist health professionals to identify cognitive decline in older Brazilians with lower education who tend to show poor performance in complex cognitive testing. Also, previous findings (Pereira et al., 2008) indicate that DAFS-BR may be useful to identify preclinical dementia, providing information regarding subtle dysfunctions in the capacity to perform activities of daily living, and allowing for early intervention initiatives. Current findings show that DAFS-BR maintains its original psychometric characteristics, with adequate reliability and validity measures for the evaluation of functional performance in Brazil.

In conclusion, the evaluation of the psychometric properties of DAFS-BR yielded favorable results and support its use among Brazilian older adults. Limitations of the current study include the relatively small sample size and the fact that the study was based on a clinical sample, which limits the generalization of present results to other populations. In addition, not all functional domains necessary to independent living are surveyed by DAFS-BR, such as meal preparation, medication management, safety, and mobility; therefore, the use of this instrument may need to be complemented by subjective reports or other performance-based tools. Yet, the authors believe DAFS-BR contributes with valuable information which may aid accurate diagnostic, treatment, and care decisions.

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Conflict of Interest

None declared.

Appendix: Cross-cultural modifications

(1) Modification of some grocery items to Brazilian products, final list

Package of rice 1 kg | Can of baking soda 100 g
Package of salt 1 kg | Eggs 12 un
Ketchup 200 g | Coffee 200 g
Milk 1 l | Package crackers 200 g
Can of tuna fish 120 g | Orange Juice 1 l
Kitchen sponges 1 un | Detergent 500 ml
Soda 600 ml | Chocolate 30 g
Can of peas 300 g | Margarine 200 g
Jelly 30 g | Package of candy 250 g
Can of corn 300 g | Toothpaste 90 g
Macaroni 500 g

(2) Stimulus card with Brazilian names, original telephone numbers were maintained

Beatriz Silva 656–0380
Maria Hering 856–0381
Daniel Junior 756–0236
João Faria 324–5612
Davi Haus 856–7177

(3) Stimulus card of address adapted to Brazilian context

Jorge Silveira
Rua Frei Caneca. Número 92
São Paulo, SP.
CEP: 33176-000

(4) Adaptation of the currency, dollar bills to Brazilian currency (real)

3 coins of 1 cent
1 coin of 5 cents
2 coins of 10 cents
3 coins of 25 cents
1 bill of 10 reais
1 bill of 5 reais
3 bills of 1 real

(5) The checkbook sheets were adapted to be similar to the ones used in Brazil.

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Bottino, C. M. C., Almeida, O. P., Tamai, S., Forlenza, O. V., Scalo, M. Z., & Carvalho, I. A. M. (1999). Entrevista Estruturada para Diagnóstico de Transtornos Mentais em Idosos, PROTER (Structured Interview for the Diagnosis of Mental Disorders in the Elderly), Instituto de Psiquiatria do Hospital das Clínicas da Faculdade de Medicina da USP.


