



# The Manchester Respiratory Activities of Daily Living questionnaire for use in COPD patients: translation into Portuguese and cross-cultural adaptation for use in Brazil

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## ABSTRACT

**Objective:** To translate The Manchester Respiratory Activities of Daily Living (MRADL) questionnaire into Portuguese and to create a version of the MRADL that is cross-culturally adapted for use in Brazil. **Methods:** The English-language version of the MRADL was translated into Portuguese by two health care researchers who were fluent in English. A consensus version was obtained by other two researchers and a pulmonologist. That version was back-translated into English by another translator who was a native speaker of English and fluent in Portuguese. The cognitive debriefing process consisted in having 10 COPD patients complete the translated questionnaire in order to test its understandability, clarity, and acceptability in the target population. On the basis of the results, the final Portuguese-language version of the MRADL was produced and approved by the committee and one of the authors of the original questionnaire. **Results:** The author of the MRADL questioned only a few items in the translated version, and some changes were made to the mobility and personal hygiene domains. Cultural differences regarding the domestic activities domain were found, in particular regarding the item “Do you have the ability to do a full clothes wash and hang them out to dry?”, due to socioeconomic and climatic issues. The item “Do you take care of your garden?” was questioned by the participants who lived in apartments, being modified to “Do you take care of your garden or plants in your apartment?” **Conclusions:** The final Portuguese-language version of the MRADL adapted for use in Brazil was found to be easy to understand and easily applied.

**Keywords:** Activities of daily living; Questionnaires; Translations; Pulmonary disease, chronic obstructive.

## INTRODUCTION

Characterized by irreversible airflow obstruction, which is usually progressive, COPD worsens as a result of inhalation of smoke and noxious gases.<sup>(1)</sup> This disease, which is preventable and treatable, has various systemic manifestations, such as skeletal muscle dysfunction related to decreased exercise capacity, which, in association with dyspnea, tends to cause impairment of activities of daily living (ADLs).<sup>(2,3)</sup>

Impairment of ADLs in individuals with COPD can be assessed by the six-minute walk test, the six-minute walk distance being considered a good marker of functional capacity.<sup>(4)</sup> However, this test does not identify which activities are impaired, nor does it assess impairment of activities performed with the arms, which are invariably involved in ADLs.

There are few validated tools to assess impairment of ADLs in patients with COPD. The available instruments have little applicability in severely impaired patients<sup>(5)</sup> or

show limited sensitivity to changes following interventions, such as pulmonary rehabilitation.<sup>(6)</sup>

Yohannes et al.<sup>(7)</sup> developed the Manchester Respiratory Activities of Daily Living (MRADL) questionnaire, which has been used as a physical disability scale in elderly patients with COPD<sup>(8)</sup> and consists of four domains: mobility (7 items); activities in the kitchen (4 items); domestic tasks (6 items); and leisure activities (4 items). The MRADL is aimed at assessing ADL impairment in patients with COPD. The scoring system ranges from 0 to 21, with the maximum score indicating no physical disability. The MRADL is an adapted composite of the Nottingham Extended Activities of Daily Living Questionnaire and the Breathing Problems Questionnaire.<sup>(7)</sup> The MRADL is valid, reliable, and reproducible, as well as being easy and rapid to complete (10 min), in addition to distinguishing between individuals with COPD and healthy elderly individuals and being sensitive to pulmonary rehabilitation.<sup>(7,8)</sup> It has good internal consistency (Cronbach’s alpha coefficient = 0.91),<sup>(7)</sup> with low final scores indicating difficulties in ADLs.

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A score  $\leq 7.5$  is considered a predictor of mortality.<sup>(9)</sup> However, because the MRADL is an instrument originally developed in English, it should be translated into the target language and adapted to the social and cultural circumstances of the target country.<sup>(10-13)</sup>

In this context, the objective of the present study was to translate the MRADL into Portuguese and to create a version of the MRADL that is cross-culturally adapted for use in Brazil.

## METHODS

The study sample was intentionally comprised of 10 patients who had been diagnosed with COPD and were treated at the pulmonology outpatient clinic of the Federal University of Santa Catarina University Hospital, located in the city of Florianópolis, Brazil. The inclusion criteria were as follows: having previously been diagnosed with COPD by spirometry, in accordance with the Global Initiative for Chronic Obstructive Lung Disease criteria<sup>(1)</sup> (post-bronchodilator  $FEV_1/FVC$  ratio  $< 0.70$ ); having shown clinical stability in the signs and symptoms of COPD in the last four weeks; having been free from respiratory infection and COPD exacerbation in the last three months; and being able to understand the study procedures. Patients who had a respiratory disease other than COPD were excluded, as were those who had a systemic inflammatory disease and those who had a mental illness or a deficit in understanding or forming speech that would prevent them from answering the questions in the instrument. Symptoms and health status were assessed by the COPD Assessment Test (CAT),<sup>(14)</sup> and patients were evaluated for dyspnea on the basis of the modified Medical Research Council (mMRC) scale score,<sup>(15)</sup> which was used for the classification of disease severity.

The study was approved by the Human Research Ethics Committee of the Federal University of Santa Catarina (Protocol no. 800.310). The translation and cross-cultural adaptation of the MRADL were performed as described by Guillemin et al.<sup>(16)</sup> and Wild et al.<sup>(17)</sup> In Brazil, Felisbino et al. used this methodology to translate a chronic cough questionnaire into Brazilian Portuguese and adapt it for use in Brazil.<sup>(18)</sup>

The cross-cultural adaptation process was carried out, in phases, strictly in accordance with internationally accepted guidelines<sup>(17)</sup>: acquisition of permission for cross-cultural adaptation and acquisition of the rights of use of the MRADL from one of its original authors; translation of the MRADL from English into Portuguese; reconciliation; back-translation; review and harmonization of the back-translation; acquisition of approval from the author of the MRADL; review of the Portuguese-language version of the MRADL by experts; cognitive debriefing; and reconciliation/preparation of the final version.

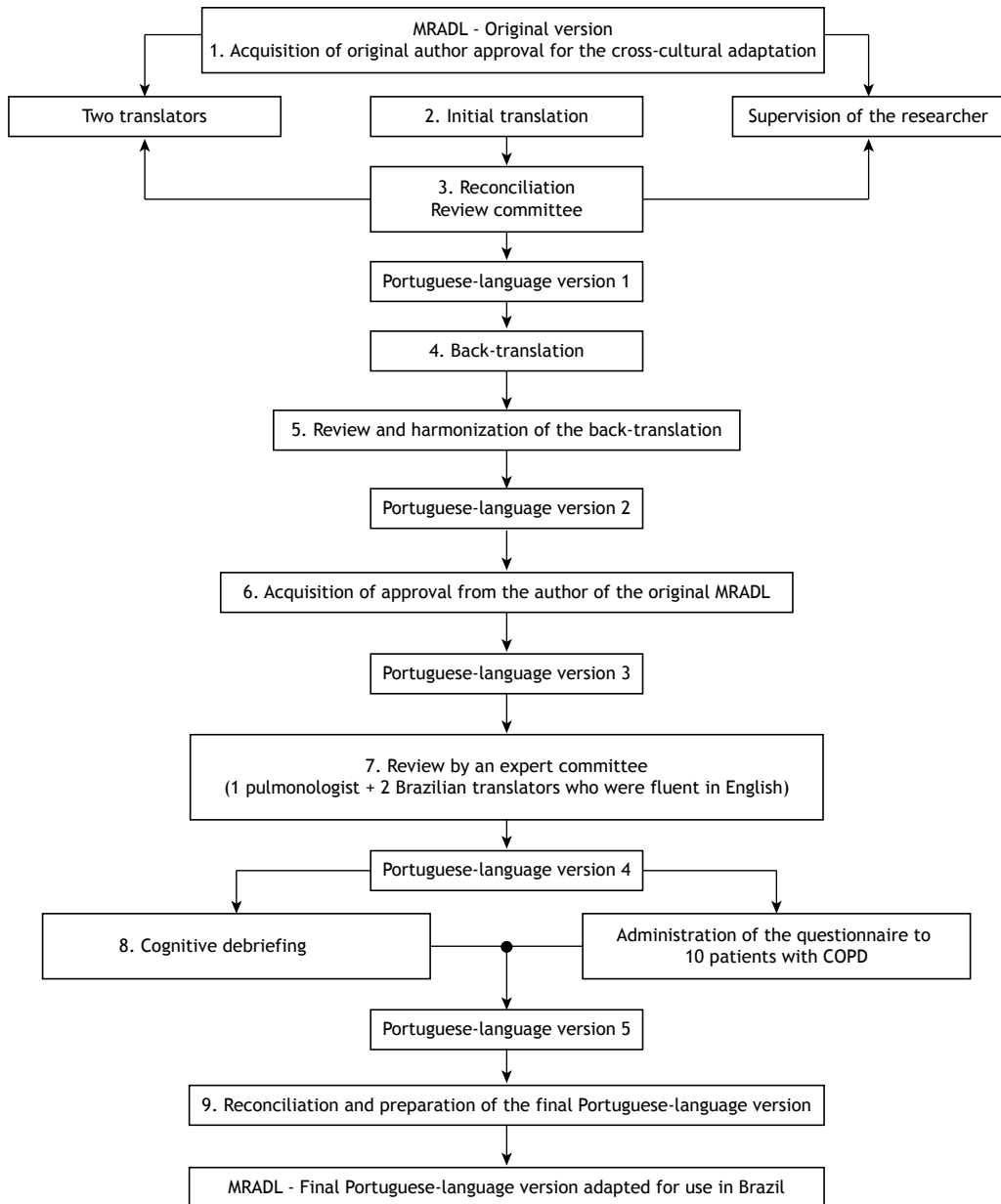
First, the MRADL was translated from English into Portuguese by two bilingual researchers who participated in this study, and then a review committee met to produce a first Portuguese-language version.

Subsequently, the major questions raised and difficulties encountered were discussed with the author of the questionnaire, and a second version was reached.

The second Portuguese-language version of the MRADL was back-translated into English by a translator who was a native speaker of English and fluent in Portuguese. The back-translation was then reviewed by the review committee, which produced a back-translated English version and a matching Portuguese-language version. The back-translated version was sent to one of the authors of the original MRADL for evaluation, and, once that had been approved, a third Portuguese-language version of the MRADL was produced. The third version was reviewed by an expert committee, which included a bilingual pulmonologist and two Brazilian translators who were fluent in English and performed the translation independently, and, subsequently, a fourth Portuguese-language version of the MRADL was produced. The fourth version was used in the cognitive debriefing process, with the questionnaire being administered to the study participants. Questions regarding and difficulties related to the text were addressed, and, at the end of this phase, a fifth version was produced. After reconciliation, the final Portuguese-language version of the MRADL was produced (Figure 1).

The cognitive debriefing process consisted of a preliminary test, i.e., a pretest to identify problems in the text of the questionnaire (complexity of the questions, imprecise wording, unnecessary questions, embarrassment or exhaustion caused to respondents, etc.)<sup>(19)</sup> and offer solutions to make it easier to understand. To that end, we chose 10 individuals with COPD, because they belonged to the population under study,<sup>(19,20)</sup> and administered the translated questionnaire to them in order to assess the clarity and precision of the terms; the form, break-down, and order of the questions; and the introduction to the questionnaire.<sup>(19)</sup> In this phase, the following elements were also investigated: reliability (the same results will always be obtained with the questionnaire, regardless of who administers it); validity (the data collected are necessary to the research); and operability (accessible vocabulary and clear meaning).<sup>(20)</sup> During the visit, the study was explained in detail, and individuals who agreed to participate gave written informed consent. In addition, anthropometric data were collected and spirometry was performed to diagnose COPD. In addition, the CAT and the mMRC scale were administered. The MRADL was administered to each participant by the same researcher. Individuals were informed that they should not worry about the accuracy of their responses, but rather just report what they understood, any problems related to the questions or statements on the questionnaire, and their level of acceptance of the questionnaire. During the administration of the MRADL, the researcher and the patient were alone. The researcher read the questions to the participant and re-read them if necessary but did not explain them.

Finally, in the reconciliation phase, the review committee and the expert committee met to produce



**Figure 1.** Summary of the process of translating the Manchester Respiratory Activities of Daily Living (MRADL) questionnaire into Brazilian Portuguese and creating a version of the MRADL that is cross-culturally adapted for use in Brazil.

the final Portuguese-language version of the MRADL. To that end, the instrument was analyzed item by item. The cognitive debriefing findings were discussed by the authors of this study and the author of the original questionnaire, and the relevant changes were made. Therefore, the final Portuguese-language version of the MRADL adapted for use in Brazil was produced. The phases of the study can be seen in Figure 1.

**RESULTS**

Of the 10 patients interviewed in the cognitive debriefing phase, 7 were female, all were White, and all resided in the greater metropolitan area of

Florianópolis. The general, anthropometric, and clinical characteristics of the participants are listed in Table 1.

During the MRADL translation phase, there were some questions raised and suggestions made for changes, with changes being made with the approval of the author of the MRADL. The item "Do you cross roads?" was changed to "Do you cross the street?" The item "Do you wash and dry yourself?" was changed to "Do you carry out personal hygiene (brush your teeth, wash your face, comb your hair)?", expanding the scope of the question to the ability of individuals to perform their personal hygiene in general. The items to which changes were made after the translation of

the original questionnaire can be seen in Table 2. In addition, in this phase, the item "Do you cross roads?" was questioned by the experts because "streets" and "roads" are considered to be the same type of route in Brazil, and the item was changed to "Do you cross the street?" "Do you wash and dry yourself?" was initially translated as "Você se lava e se seca?"; however, the translators discussed between themselves and questioned the author of the original questionnaire about the equivalence between that item and the item "Do you have a bath?", both of which were aimed at determining the patients' ability to bathe themselves. Nevertheless, "Do you have a bath?" means bathing in a bathtub, which is not very common in Brazil, where few people have a bathtub at home. Therefore, the item was changed to "Do you carry out personal hygiene (brush your teeth, wash your face, comb your hair)?", which can detect impairment of personal hygiene in general.

In the back-translation of the MRADL into English, the following items underwent changes: "Do you walk around outside?" was back-translated as "Do you go hiking outdoors?"; however, the author of the MRADL suggested that the item remain as in the original version. The item "Do you walk over uneven ground?", which was back-translated as "Do you walk on irregular terrain?", remained as in the original version because the author of the original questionnaire did not agree with using the word "terrain", arguing that it would alter the original meaning of the question. The domestic activities domain subheading was back-translated as "home chores", there being no change in its meaning in Portuguese. The back-translation of the item "Do you wash small items of clothing?" as "Do you wash small garments?" was discarded by the author of the original questionnaire because the term "garments" was considered inappropriate.

The review by the expert committee indicated some grammatical errors and offered conceptual suggestions, as well as questioning whether the item "Do you walk around outside?" was meant to refer to mobility (confidence in leaving home) or to physical activity (walking). The author of the MRADL explained that this item refers to both, as well as to social interaction, and therefore it was changed to "Do you walk outside the house?" The item "Do you do a full clothes wash?" was changed to "Do you have the ability to do a full clothes wash and hang them out to dry?" because of socioeconomic issues, because, in Brazil, not everyone has a washer, and because of climatic issues, taking into account that most people hang clothes on the clothesline to dry and do not have a dryer. The items to which changes were made after the review by the expert committee are listed in Table 3.

During the cognitive debriefing phase, participants raised some questions about the text. The item "Do you get in and out of the car?" was questioned by participants because some of them had difficulty in performing only one of these activities. However, the author of the original questionnaire suggested

that the item remain in the questionnaire and that difficulty in performing only one of the activities be considered impairment. For the item "Do you bend over from standing?", it was necessary to explain and even simulate the movement, and the item was changed to "Do you bend over from standing position to pick up an object?" for better understanding. The item "Do you do the washing up?" was questioned by participants because, for cultural reasons, this activity is performed mostly by women in Brazil; however, the author of the MRADL suggested that the item remain in the questionnaire, because it refers to the ability of individuals to perform the activity, even if they do not do it frequently. The items "Do you wash small items of clothing?" and "Do you have the ability to do a full clothes wash and hang them out to dry?" remained in the questionnaire and should be taken into account even if patients use a washer, in which case the patients' ability to put clothes into and take them out of the washer to hang them on the clothesline should be

**Table 1.** General, anthropometric, and clinical characteristics of the participants.<sup>a</sup>

| Characteristic                    | Result      |
|-----------------------------------|-------------|
| Gender, M/F                       | 3/7         |
| Smokers, yes/no                   | 4/6         |
| Age, years                        | 62.6 ± 9.9  |
| Weight, kg                        | 69.5 ± 13.5 |
| Height, m                         | 1.6 ± 0.1   |
| Smoking history, pack-years       | 38.4 ± 38.8 |
| FEV <sub>1</sub> , L              | 1.2 ± 0.8   |
| FEV <sub>1</sub> , % of predicted | 36.4 ± 14.4 |
| FVC, L                            | 2.1 ± 0.9   |
| FVC, % of predicted               | 49.9 ± 11.5 |
| FEV <sub>1</sub> /FVC, %          | 54.4 ± 11.3 |
| CAT score                         | 18.3 ± 7.9  |
| mMRC dyspnea scale score          | 1.4 ± 0.9   |

CAT: COPD Assessment Test; and mMRC: modified Medical Research Council. <sup>a</sup>Values expressed as n/n or mean ± SD.

**Table 2.** The Manchester Respiratory Activities of Daily Living questionnaire items to which changes were made after their translation into Brazilian Portuguese.

| Initial translation   | Portuguese-language version 1   |
|-----------------------|---|
| "Atravessa estradas?" | "Atravessa a rua?"  |
| "Se lava e se seca?"  | "Realiza higiene pessoal (escovar os dentes, lavar o rosto, pentear o cabelo)?" |

**Table 3.** The Manchester Respiratory Activities of Daily Living questionnaire items to which changes were made after the review by the expert committee.

| Original English-language version | Modified English-language version   |
|-----------------------------------|---|
| "Do you walk around outside?"     | "Do you walk outside the house?"  |
| "Do you do a full clothes wash?"  | "Do you have the ability to do a full clothes wash and hang them out to dry?" |

assessed. Finally, the item “Do you manage your own garden?” was questioned by the individuals who lived in apartments and did not have a garden, and it was realized that some individuals in the sample would have a low total score. Therefore, that item was modified to “Do you take care of your garden or plants in your apartment?” The items to which changes were made after the cognitive debriefing can be seen in Table 4.

During the analysis of the latest provisional version of the MRADL, the author of the original instrument suggested that the following changes be made to its instructions: “This scale was elaborated” was changed to “This scale is designed” and “Circle the most appropriate response that best describes you” was changed to “Reply with one tick (✓) that best describes you”. The final Portuguese-language version of the MRADL can be seen in Chart 1.

### DISCUSSION

In the present study, the MRADL was translated into Portuguese and a version of the MRADL that is cross-culturally adapted for use in Brazil was created, with some caveats and changes.

There are some validated instruments to assess functional disability in patients with COPD; however, such instruments have little applicability in severely impaired patients.<sup>(21)</sup> That underscores the importance of the instrument translated in the present study, because the MRADL is aimed at assessing impairment of ADLs in individuals with COPD, as well as being able to detect overall impairment, even in severely ill individuals. The individuals included in the present study had a mean CAT score and a mean mMRC dyspnea scale score of  $18.3 \pm 7.9$  and  $1.4 \pm 0.9$ , respectively, which demonstrates the severity of their disease, given that a CAT score  $\geq 10$  and an mMRC score  $\geq 2$  are indicative of high impact of symptoms.<sup>(1)</sup>

Among the available instruments that have been validated for use in Brazil, few assess impairment of ADLs specifically in patients with COPD.<sup>(15,21-23)</sup> One of the questionnaires developed specifically to assess impairment of ADLs in patients with COPD—the Pulmonary Functional Status and Dyspnea Questionnaire - Modified version—consists of three domains (influence of dyspnea on ADLs, influence of fatigue on ADLs, and change in ADLs after disease onset).<sup>(23)</sup> However, the instrument is not appropriate for assessing individuals

who are elderly or severely impaired, because it includes questions regarding tasks that are more complex.

There are several predictors of prognosis for individuals with COPD, including lean body mass index, frequency of hospitalizations for acute exacerbations, and classification of symptoms.<sup>(24)</sup> The six-minute walk test is also widely used.<sup>(23)</sup> However, its use is limited because it does not assess functional capacity in patients who are more severely ill. The MRADL has proven useful in the assessment of physical disability as a predictor of mortality in elderly individuals with COPD,<sup>(24)</sup> which suggests that this instrument is more beneficial in clinical practice.

Of the patients interviewed in the cognitive debriefing phase, 70% were female, and all resided in the greater metropolitan area of Florianópolis. The region accounts for 18% of the total population of the state of Santa Catarina, which, in recent years, has shown low fertility rates and a trend toward growth in the number of elderly individuals; in addition, in Santa Catarina, the proportion of females in the elderly age group is higher than is that of males, a fact that can be explained by the greater exposure of men to a set of risk factors, such as alcohol use, smoking, and violence.<sup>(25)</sup> Therefore, the present study sample does not appear to be representative of the prevalence of COPD, which is higher in men.<sup>(26)</sup>

One of the difficulties found was an inability of respondents to differentiate among the response options for each ADL, because some of them reported not performing some activities because someone did that for them, and not because they were unable to perform them. Difficulties in interpreting the items assessed have also been identified in other studies, and such items need to be rephrased in order to be more easily understood.<sup>(21,22)</sup>

During the final reconciliation process carried out by the expert committee in order to prepare the final Portuguese-language version of the MRADL, it was suggested that a response option reading “not applicable” be included to minimize possible misinterpretations of responses, because, in Brazil, women make up more than 90% of all domestic workers, which shows that they predominate in this sector.<sup>(27)</sup> However, this suggestion was not accepted by the author of the original instrument, because the primary objective of the MRADL is to identify individuals severely affected by COPD and because the change would negatively affect the scoring system, making it difficult to quantify the results. A validation study is needed in order to assess the use of the MRADL, the scoring system applied, and the score by gender. Perhaps a different score should be considered for males, in order to reduce limitations in the items that comprise the “domestic activities” domain.

In a study aimed at performing a translation and cultural adaptation<sup>(21)</sup> of another measure of functional disability in patients with COPD, the London Chest Activity of Daily Living scale, an alternative scoring

**Table 4.** The Manchester Respiratory Activities of Daily Living questionnaire items to which changes were made after the cognitive debriefing phase.

| Portuguese-language version 3 | Portuguese-language version 4                        |
|-------------------------------|--|
| “Curva-se na posição em pé?”  | “Curva-se na posição em pé para pegar um objeto?”    |
| “Cuida do seu jardim?”        | “Cuida do seu jardim ou plantas em seu apartamento?” |

**Chart 1.** Portuguese-language version of the Manchester Respiratory Activities of Daily Living questionnaire adapted for use in Brazil.

Este formulário foi elaborado para termos uma melhor compreensão sobre como seus problemas respiratórios podem afetar as suas atividades de vida diária.

Por favor, leia cada questão cuidadosamente e assinale com um "X" a alternativa que melhor descreve você:

|   | Nunca                           | Com ajuda                 | Sozinho com dificuldade        | Sozinho, facilmente        |
|---|---------------------------------|---------------------------|--------------------------------|----------------------------|
| <b>MOBILIDADE</b>   |                                 |                           |                                |                            |
| Você:   |                                 |                           |                                |                            |
| Faz passeios a pé?  | -----                           | -----                     | -----                          | -----                      |
| Sobe escadas?   | -----                           | -----                     | -----                          | -----                      |
| Entra e sai do carro?   | -----                           | -----                     | -----                          | -----                      |
| Caminha em terrenos irregulares?  | -----                           | -----                     | -----                          | -----                      |
| Atravessa a rua?  | -----                           | -----                     | -----                          | -----                      |
| Usa transporte público?   | -----                           | -----                     | -----                          | -----                      |
| Se inclina a partir da posição em pé para pegar um objeto?                    | -----                           | -----                     | -----                          | -----                      |
| <b>NA COZINHA</b>   |                                 |                           |                                |                            |
| Você:   |                                 |                           |                                |                            |
| Pega algo que está em uma prateleira mais alta ou na altura de seus ombros?   | -----                           | -----                     | -----                          | -----                      |
| Leva bebidas quentes de um cômodo para outro?                                 | -----                           | -----                     | -----                          | -----                      |
| Lava a louça?   | -----                           | -----                     | -----                          | -----                      |
| Faz um lanche quente para você?   | -----                           | -----                     | -----                          | -----                      |
| <b>ATIVIDADES DOMÉSTICAS</b>  |                                 |                           |                                |                            |
| Você:   |                                 |                           |                                |                            |
| Realiza atividades domésticas em geral?                                       | -----                           | -----                     | -----                          | -----                      |
| Lava peças pequenas de roupa?   | -----                           | -----                     | -----                          | -----                      |
| Faz suas próprias compras?  | -----                           | -----                     | -----                          | -----                      |
| Consegue lavar a roupa e estendê-la para secar?                               | -----                           | -----                     | -----                          | -----                      |
| Faz sua higiene pessoal (escovar os dentes, lavar o rosto, pentear o cabelo)? | -----                           | -----                     | -----                          | -----                      |
| Toma banho?   | -----                           | -----                     | -----                          | -----                      |
| <b>ATIVIDADES DE LAZER</b>  |                                 |                           |                                |                            |
| Você:   |                                 |                           |                                |                            |
| Sai socialmente?  | -----                           | -----                     | -----                          | -----                      |
| Cuida do seu jardim ou de suas plantas em seu apartamento?                    | -----                           | -----                     | -----                          | -----                      |
| Você precisa comer mais devagar do que gostaria? (*)                          | Muito mais devagar<br>-----     | Mais devagar<br>-----     | Um pouco mais devagar<br>----- | De maneira alguma<br>----- |
| Sua respiração deixa você acordado(a) durante a noite? (*)                    | A maior parte da noite<br>----- | Por 1 ou 2 horas<br>----- | Mais de ½ hora<br>-----        | Não<br>-----               |

Sistema de pontuação: Classificação das respostas: sozinho; sozinho com dificuldade; com ajuda; nunca  
Escore:

0 – com ajuda; nunca (\*muito mais devagar, mais devagar, a maior parte da noite, por 1 ou 2 horas).

1 – sozinho, facilmente; sozinho com dificuldade (\*um pouco mais devagar; mais de ½ hora; não).

system was designed for the item "I do not perform this activity (because I have never needed to or it is irrelevant)." in order to disregard the questions for which the patient would score zero and prevent men completing the questionnaire from having a score that does not reflect their actual functional impairment, thereby identifying individuals who do not perform certain activities for reasons other than those related to the lung disease.

The study participants, according to the criteria used in the present study, were classified as patients with severe COPD (Table 1).<sup>(1)</sup> This made it impossible to assess the MRADL in terms of its applicability in individuals with mild disease. The objective of the present study was to translate the MRADL into Portuguese and to create a version of the MRADL that is cross-culturally adapted for use in Brazil. Although the MRADL is a self-report questionnaire, we chose to interview participants in order to receive their

suggestions. In order to test the applicability of the MRADL, as well as its reproducibility, a study is being conducted to assess its internal validity by determining interobserver and intraobserver variability.<sup>(28)</sup> A larger convenience sample will be used for those phases.<sup>(29)</sup>

The respondents' comments regarding the instrument were quite helpful. Their suggestions were relevant

and essential to the changes made. Therefore, the MRADL has now been translated and adapted for use in Brazil. The final Portuguese-language version of the MRADL was found to be easy to understand and easy to administer, as well as being a useful instrument to assess the physical limitations and determine the prognosis of individuals with COPD.

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