Translation, Cross-cultural Adaptation and Reliability of Brazilian portuguese version of the DRAM Questionnaire for Psychometric Evaluation in Low Back Pain*

Tradução, adaptação cultural e confiabilidade da versão em português brasileiro do questionário DRAM para avaliação psicométrica em dor lombar

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Abstract

Objective Based on studies regarding pain physiology and its relation to emotional distress conditions, psychological evaluation became essential to determine the most favorable patient profiles to distinct therapeutic approaches. The Distress Risk Assessment Method (DRAM) has been developed as a screening instrument for patients with lumbar pain, classifying them in subgroups as normal, at risk, distressed somatic and distressed depressive, based on the two components of DRAM scores (Modified Somatic Perception Questionnaire [MSPQ] and Zung questionnaires). The objective of the present study is to translate and culturally adapt the DRAM to the Brazilian Portuguese language, and to determine the reliability of the final version.

Methods As proposed by the International Quality of Life Assessment (IQOLA) method, a Brazilian Portuguese version of the DRAM has been applied to a sample of 85 individuals from 3 participant centers.

Results The results confirmed the reliability and reproducibility of the DRAM in its Brazilian Portuguese final version: Cronbach alpha of 0.815 (MSPQ) and 0.794 (Zung) and intraclass correlation coefficient (ICC) of 0.688 (MSPQ) and 0.659 (Zung).

Conclusion The presented DRAM version in Brazilian Portuguese is reliable and is available to clinical practice use.

Keywords
- back pain
- low back pain
- spinal diseases
- quality of life
- treatment outcome
- risk assessment
- surveys and questionnaires

Resumo

Objetivo A partir de estudos sobre a fisiologia da dor e suas relações com estados psicológicos, tornou-se essencial a avaliação psicológica dos indivíduos com quadros

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dolorosos, para selecionar os perfis mais favoráveis às diferentes formas de tratamento. O questionário Distress Risk Assessment Method (DRAM, na sigla em inglês) foi desenvolvido como instrumento de triagem para portadores de dor na coluna vertebral subclassificando os indivíduos em quatro grupos distintos (normal, sob risco, somático e depressivo), conforme a pontuação dos dois questionários que compõem o DRAM (Questionário Modificado de Percepção Somática [MSPQ, na sigla em inglês] e Zung). O objetivo do presente estudo é traduzir e adaptar o DRAM para o português brasileiro da versão original em inglês, além de analisar a confiabilidade da versão traduzida e adaptada.

Método Segundo a metodologia International Quality of Life Assessment (IQOLA), consagrada em inúmeras publicações, foi desenvolvida uma versão em português brasileiro que foi aplicada a uma amostra de 85 indivíduos dos 3 centros participantes portadores de dor lombar.

Resultados Os resultados comprovaram a confiabilidade e reprodutibilidade da versão traduzida e adaptada do questionário DRAM com índice de Cronbach alfa de 0,815 para o MSPQ e de 0,794 para o Zung, e coeficiente de correlação intraclasse de 0,688 para o MSPQ e de 0,659 para o Zung.

Conclusão Tais dados permitiram concluir que a versão do questionário DRAM traduzida e adaptada culturalmente para o português brasileiro é confiável e está disponível para uso na prática clínica.

Palavras-chave
- dor nas costas
- dor lombar
- doenças da coluna vertebral
- qualidade de vida
- resultado do tratamento
- medição de risco
- inquéritos e questionários

Introduction

Low back pain is a multidimensional phenomenon composed of psychological (sensitive, affective, cognitive, behavioral) and social factors.[1,2] The main risk factors for short- and long-term disability in a clinical scenario of nonspecific low back pain are psychosocial, and permanent remission of painful conditions is linked to occupational factors and to the psychometric profile of the evaluated individuals.[3] Anxiety, depression, hostility, and other traits of psychological stress are factors that affect many health outcomes, such as pain and function.[4,5]

Due to the association between psychological disorders and spinal disorders outcomes,[6,7] it is currently accepted, as the ideal approach, the biopsychosocial model in the initial assessment, decision-making and final evaluation of these diseases. This model requires psychometric assessment instruments that result in scores that determine, in different ways, the psychological state of the evaluated individual.[8–12]

Systematic reviews of the literature have already shown the association between psychological disorders and low back pain[13] and revealed that patients with depression have worse outcomes after arthrodesis[14] and also that cognitive-behavioral therapy can reduce pain after surgery.[15] If patients with different psychological characteristics suffer from pain differently and obtain different results from surgical treatment, it makes sense to better understand these characteristics before indicating surgery. Among the numerous psychometric instruments available in the current literature, the Distress Risk Assessment Method (DRAM),[16,17] originally designed to measure psychological status in individuals with low back pain, is a psychological assessment tool to be answered by the patient.

A point of interest in the DRAM method is the ability to identify individuals of distinct psychological subtypes, in which anxious characteristics (DS) or depressive disorders (DD) may be related to behaviors that are less favorable to surgical treatments. The DRAM allows, therefore, to identify those who need a multidisciplinary approach, as they present signs of psychological stress with the potential to interfere with pain symptoms. It is a simple and efficient tool to alert medical caregivers of the need to establish a psychological joint approach to the diagnosis and medical treatment indication.

However, the DRAM tool, originally developed in English, is not available in a version validated for the Portuguese language. The aim of the present study is to create a reliable and reproducible version of the DRAM questionnaire, culturally adapted to the Portuguese language spoken in Brazil.

Method

This is a study of translation, cultural adaptation and reliability analysis of the DRAM questionnaire to the Portuguese language spoken in Brazil. The protocol of the present study was evaluated and approved by the Research Ethics Committee, according to the opinion number 36615514.7.1001.0068. All of the participants signed an informed consent form.

DRAM Questionnaire

The questionnaire consists of a combination of the score results of two other questionnaires: the Modified Somatic Perception Questionnaire (MSPQ), [17] and the Modified Zung

Depression Index (mZDI).[18] Original MSPQ is a 22 questions with 4 alternatives each self reported questionnaire, each item varies from 0 points ("not at all"), 1 ("a little/slightly"), 2 ("a great deal/quite a bit") to 3 point ("extremely/could not have been worse"). For final score, only items 2, 3, 7, 8, 9, 11, 13, 14, 16, 18, 19, 20, 21 are considered, as a way to confuse not so relevant and more relevant items. Thus, final score varies between 0 to 39 points. The MSPQ is a questionnaire designed specifically for patients with back pain and allows to quantify somatic and autonomic perception, "somatic anxiety" or "somatization". The mZDI graduates depressive distress based on the total sum of 23 items, 4 questions each questionnaire, 0 to 3 points each item, maximum total score 69 points.

From the scores obtained in the MSPQ and mZDI questionnaires, the DRAM classifies individuals as: N type, normal, with mZDI score < 17 points, without evidence of psychological disorder or abnormal behavior regarding the disease; R type, at risk, mZDI score between 17 and 33, and MSPQ score < 12, predominantly showing symptoms of depression; DD type, depressive, with mZDI score > 33; and DS type, somatic/anxious, mZDI score between 17 and 33, MSPQ > 12.

DRAM Translation and Adaptation

In order to be used in clinical practice in the Brazilian population, the DRAM was translated and culturally adapted through the methodology proposed by the project International Quality of Life Assessment (IQOLA),[19] a reliable and reproducible methodology, of simple applicability. In the present study, the translation and adaptation method, according to the IQOLA approach adapted by the American Academy of Orthopedic Surgeons (AAOS),[20] followed a simple and practical step by step, as illustrated in ►**Figure 1**.

Participants

The translated DRAM questionnaire was applied to a sample of participants, to study its psychometric properties, such as internal consistency and reproducibility. The individuals recruited for the present study were selected from orthopedic outpatient clinics and emergency services from three different cities. The present study aimed for 85 individuals, based on the sample universe of similar works.[21–23]

Inclusion criteria: individuals > 18 years old; nonspecific low back pain of any duration (mechanical and postural characteristic); literate and fluent in Brazilian Portuguese; willing and able to give written consent. Exclusion Criteria: neurological sign; trauma history; previous lumbar spine surgery; native language different from Brazilian Portuguese; previously diagnosed psychiatric disorders; cognitive impairment of any degree; neurological disease; prisoners or inmates in correctional institutions.

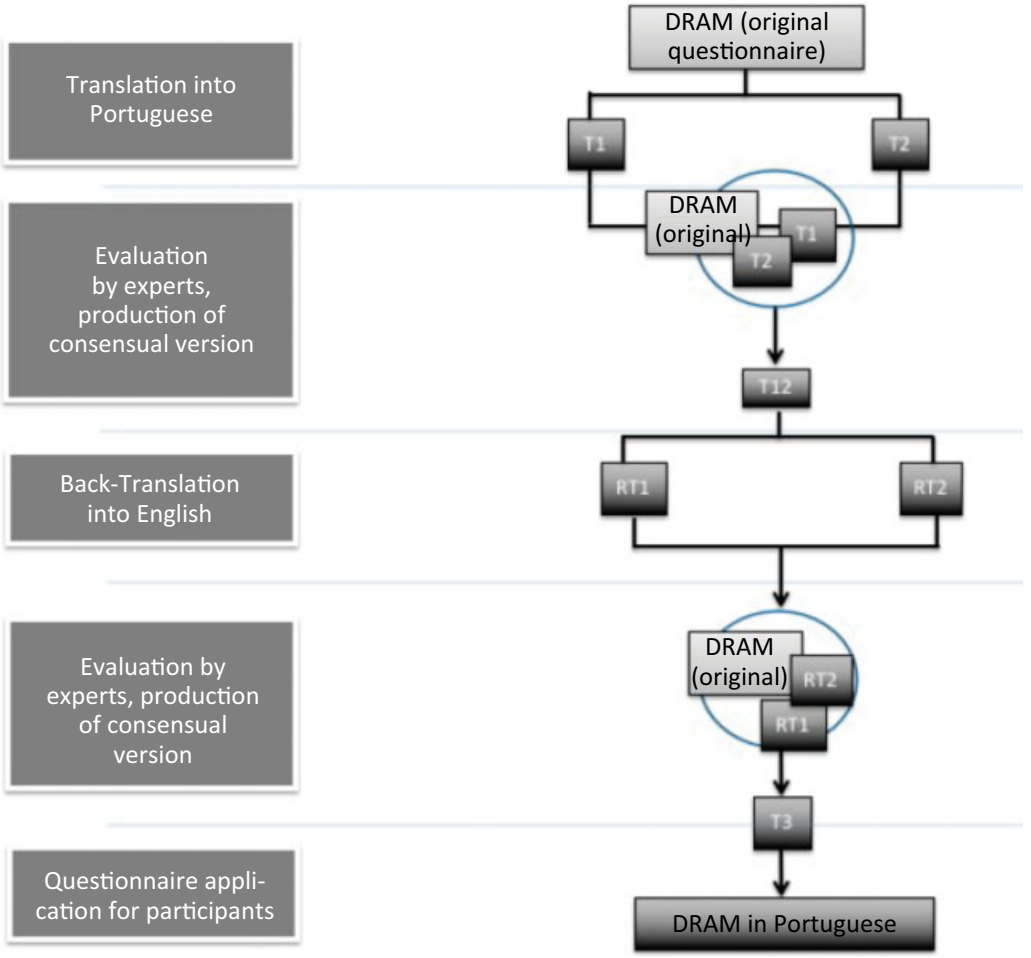

Fig. 1 Steps of the method adopted for translation and adaptation.

Translated Version Application

The translated DRAM questionnaire was initially applied to 30 individuals (pilot study), when an interim analysis was performed, and, after that, it was applied to another 55 individuals, totaling 85 respondents. The DRAM is a self-administered questionnaire; all of the patients included in the present study answered the questionnaires without any interviewer intervention. For the first 30 participants, an additional questionnaire with the following three questions was also given, providing opportunity and privacy for qualitative data that could reveal any difficulty with using the DRAM: (1) Do you have any comments on the language of this questionnaire? (2) Was there any question or item that is not clear or understandable in Portuguese? (3) Would you like to make any suggestions or comments about this questionnaire?

After this 30-application pilot sequence was completed, the lead author tabulated the DRAM data to check for any inconsistencies, and also analyzed the answers to the three questions above to make any changes or corrections to the translated questionnaire, if necessary. After analyzing the data studied at this stage, and as no problems were detected, the pilot sample was integrated into the total sample universe, and the study was continued until the sample of 85 patients was completed.

According to the IQOLA methodology,[19] the participants answered the questionnaires in 2 different situations, with intervals of 15 to 60 days between them, which corresponds to the usual time interval between consultations of patients with low back pain. Thus, it was possible to verify the reproducibility of the DRAM results, as described below.

Study of Psychometric Properties of the Translated DRAM

Individual responses to the translated DRAM were tabulated in a database per patient, as well as total scores. This was followed by an analysis of the internal consistency of the instrument using the Cronbach alpha.[24] This test indicates the homogeneity of factors between items within a questionnaire or questionnaire subdomains. The Cronbach alpha is also used to determine the interrelationship between questionnaire items. A low value indicates low correlation between items designed to measure the same construct, while a very high value indicates redundancy between one or more items. In the present study, the reference value adopted to indicate good correlation was between 0.70 and 0.95.[25]

Then, the reproducibility of the continuous data of the instrument was analyzed using the intraclass correlation coefficient (ICC). The ICC is used to measure the inter-rater reliability for two or more evaluators who rated the same individual. It can be used to assess test-retest reliability. The ICC can be conceptualized as the ratio of the variance between groups and the total variance.[26]

Data were entered, tabulated and checked in Microsoft Excel (Microsoft Corporation, Redmond, WA, USA) spreadsheets, by the main author of the present study. Statistical analysis was performed using SPSS Statistics for Windows, Version 12 (SPSS Inc. Chicago, IL, EUA).

Results

The proposed translation and cultural adaptation methodology (IQOLA) chosen for the present study proved to be practical and replicable. The two translators (one of them a sworn professional translator and the other a professional medical spine surgeon fluent in English) independently produced understandable and faithful versions of the original, as evidenced by the group of two physicians and two physiotherapists, by suggesting minimal adjustments in the creation of the T12 version of the DRAM questionnaire as well as in the development of back-translated versions.

At this stage, the expert committee discussed the colloquial expressions as *feeling hot all over*, *sweat all over*, *stomach churning*, *butterflies in the stomach* and *desire to pass water* that were compared to the proposed translations *calor por todo o corpo*, *suado no corpo todo*, *estômago embrulhado*, *frio na barriga* and *vontade de urinar*, and we concluded by the absence of discrepancies, after consultation with translators. The final version, applied to the initial sample universe (pilot) of patients with back pain, was understandable and was not the subject of comments or suggestions, as found by applying a "questionnaire on the DRAM questionnaire".

After analyzing the data studied in the pilot phase, no changes were detected to be performed. Thus, the pilot sample was integrated into the total sample universe, and the study was continued until completing the total sample of patients.

Out of 108 initially screened patients, 85 fully answered the questionnaires within the deadline for the MSPQ score and Zung depression index during their outpatient appointments, without the need to change the original treatment plan, except for the addition of the filling time of our study documents. The remaining 23 individuals were excluded because they did not answer the questionnaires a second time or because they answered after the deadline of 15 to 60 days. ►**Table 1** shows the description of the questionnaire scores on both occasions of completion.

A total of 85 individuals were included; 54 (63.5%) were female, aged between 22 and 55 years old, with a mean age of 31.2 years. Regarding education, 40 (46.7%) attended primary school, 37 (43.5%) had completed high school, and 8 (9.8%) had a university degree.

The internal consistency of the final version of the DRAM questionnaire (►**Table 2**) was verified by the Cronbach alpha

Table 1 Modified Somatic Perception Questionnaire score and modified Zung Self-Rating Depression Scale, in its first and second applications.

	Mean	Standard deviation
MSPQ 1	11.6706	6.57446
MSPQ 2	10.0000	5.63577
Zung 1	24.9882	9.63562
Zung 2	23.0353	8.21359

Abbreviation: MSPQ, modified somatic perception questionnaire.

Table 2 Brazilian Portuguese version of the DRAM questionnaire

MSPQ				
Descreva como você se sentiu durante a SEMANA PASSADA assinalando com um (X) na caixa apropriada. Responda todas as perguntas. Não pense muito antes de responder.				
	Nunca	**Um pouco**	**Bastante, muito**	**Demais, não poderia ser pior**
Aumento na frequência cardíaca	0	1	2	3
Sensação de calor no corpo todo	0	1	2	3
Suado no corpo todo	0	1	2	3
Suado em uma parte específica do corpo	0	1	2	3
Palpitação nas veias do pescoço	0	1	2	3
Dor de cabeça latejante	0	1	2	3
Tontura	0	1	2	3
Visão embaçada	0	1	2	3
Sensação de desmaio	0	1	2	3
Sensação de que tudo parece irreal	0	1	2	3
Náusea	0	1	2	3
Sensação de 'frio na barriga'	0	1	2	3
Dor de estômago	0	1	2	3
Estômago 'embrulhado'	0	1	2	3
Vontade de urinar	0	1	2	3
Sensação de boca seca	0	1	2	3
Dificuldade para engolir	0	1	2	3
Dor no pescoço	0	1	2	3
Sensação de fraqueza nas pernas	0	1	2	3
Contração ou tremor dos músculos	0	1	2	3
Sensação de tensão na testa	0	1	2	3
Sensação de tensão nos músculos da mandíbula ('músculos da mordida')	0	1	2	3
Índice de depressão Zung modificado				
Para cada uma das perguntas abaixo, indique o que melhor descreve como você se sente recentemente.				
	Raramente ou muito pouco (menos de 1 dia por semana)	**Uma pequena parte do tempo (1-2 dias por semana)**	**Razoável parte do tempo (3-4 dias por semana)**	**A maior parte do tempo (5-7 dias por semana)**
1. Eu me sinto desanimado e triste	0	1	2	3
2. Eu me sinto melhor de manhã	3	2	1	0
3. Tenho crises de choro ou vontade de chorar	0	1	2	3
4. Tenho dificuldades para dormir à noite	0	1	2	3
5. Acho que ninguém se importa comigo	0	1	2	3
6. Estou comendo mais do que costumava comer	3	2	1	0
7. Eu ainda gosto de sexo	3	2	1	0
8. Percebo que estou perdendo peso	0	1	2	3
9. Estou com problemas de constipação (prisão de ventre)	0	1	2	3
10. Meu coração está batendo mais rápido do que o habitual	0	1	2	3
11. Fico cansado sem motivo	0	1	2	3

Table 2 (*Continued*)

12. Tenho a mesma clareza de ideias que antigamente	3	2	1	0
13. Eu tenho tendência de acordar muito cedo	0	1	2	3
14. Tenho a mesma facilidade para fazer as coisas que costumava	3	2	1	0
15. Estou agitado e não consigo ficar parado	0	1	2	3
16. Tenho esperança quanto ao meu futuro	3	2	1	0
17. Estou mais irritado do que o habitual	0	1	2	3
18. Acho fácil tomar decisões	3	2	1	0
19. Sinto-me bastante culpado	0	1	2	3
20. Acho que sou útil e necessário	3	2	1	0
21. Minha vida é bastante completa	3	2	1	0
22. Acho que os outros estariam melhor se eu estivesse morto	0	1	2	3
23. Ainda sou capaz de gostar das coisas que eu costumava	3	2	1	0

Abreviação: MSPQ, questionário modificado de percepção somática.

index resulting from the present study: 0.815 and 0.794, for the MSPQ and the modified Zung, respectively.

The ICC between the first and second applications of the MSPQ and Zung questionnaires was calculated. For the MSPQ, the ICC was 0.688 ($p = 0.0001$). For the Zung, it was 0.659 ($p = 0.0001$).

Discussion

Regarding nonspecific low back pain, unfavorable psychosocial aspects, such as anxiety, depression or worker compensation, are predictors of short- and long-term disability[3] and risk factors for poor outcomes of any therapeutic modality are often three to four times higher than in psychologically healthy individuals.[27] Thus, low back pain care should identify poor prognostic factors for the appropriate therapeutic approach,[16,18] by applying one of the available psychometric screening tools (DRAM, StarT Back, Orebro), and a disability questionnaire (Oswestry index).[28]

Even with the extensive literature in favor of the routine use of psychological assessment tools, the number of medical assistants that use these instruments in clinical practice is relatively low.[27,29] According to Daubs et al,[29] in addition, spine surgeons are able to diagnose psychological disorders in only 16.9% of cases of individuals with psychological disorders being treated. Even so, most of these specialists (63%) do not use any psychometric assessment instrument in their daily practice.[27]

The DRAM[16] was specifically developed as a screening tool for low back pain cases in the British healthcare system and consists of the sum of the scores from two separate questionnaires: MSPQ and Zung, which evaluate states of anxiety and depression, respectively, and classify individuals into four distinct psychological subtypes. In the original article by Main,[16] the author reported that individuals of subtype N submitted to surgical treatment evolved satisfactorily, and the conversion of R subtypes to N subtype confirmed the favorable surgical outcome. As for subjects undergoing conservative treatment, those of subtype R had unfavorable outcomes twice as often as subtypes N, while DD and DS subtypes were three to four times more likely to have poor results.

The DRAM has been used by numerous authors as a complementary tool in the evaluation of surgical outcomes,[29–33] as already highlighted in the original study.[16] The newer Orebro and StarT Back tools have been described in the literature for studies related to the screening of conservative treatment and psychosocial aspects of spinal pain bearers.[34,35] Compared to others, the DRAM is longer (45 questions) than the Orebro (23 questions)[36] and the StarT Back (9 questions),[9] an undesirable feature for application in current daily practice.

The criteria to certify the quality of the final version of the Brazilian Portuguese DRAM were internal consistency and reproducibility.[24] Internal consistency was determined by the Cronbach alpha index and resulted in 0.815 for MSPQ and 0.794 for Zung, values that confirm the quality of the final version of the DRAM, within the parameters suggested for quality of life questionnaires, between 0.70 and 0.90.[24] For the reproducibility study, the ICC was chosen, resulting in values of 0.688 ($p = 0.0001$) for the MSPQ and 0.659 ($p = 0.0001$) for the Zung, tests for which, according to Cicchetti,[37] values between 0.60 and 0.74 are considered sufficient to guarantee the statistical quality of the evaluations. According to the proposed statistical criteria, the final version of the DRAM in Brazilian Portuguese is reliable and reproducible, as well as equivalent to the original version and can be used in the clinical practice.

Although the reliability and reproducibility results achieved the initial objective of the present study to

guarantee the quality of the final DRAM version in Brazilian Portuguese, some additional criteria could have been used, especially the construct validity study compared to a similar questionnaire such as the Orebro. This was a limitation of the present study.

The DRAM was developed in 1992 and pioneered psychometric questionnaires designed specifically for a group of individuals with low back pain. Thus, its format and extension were not the target of the attention of its creators, but certainly its content and its ability to screen psychological profiles favorable to different treatment modalities. So, compared to more recent questionnaires, as the StarT Back, DRAM is more extensive and detailed. However, in the experience of the lead author of the present study, although longer, it is applicable either to patients in the private or in the public service office.

The translation of the DRAM into Brazilian Portuguese opens perspectives for future research: DRAM as an outcome tool; DRAM as a specific patient selection tool for treatment; development of another psychometric tool originally for the Brazilian population.

The use of psychometric tools is a differential in the current approach to degenerative diseases of the spine, especially those in which there may be a surgical solution, since individuals with identical diagnoses, such as lumbar radiculopathy, for example, but with different psychological profiles, can achieve quite different outcomes with similar treatments.[38] In such cases, a minimum understanding of the psychological state of each patient enables the surgeon to choose the most effective therapeutic choice for each individual, especially those whose psychological profiles favor conservative approaches.

Conclusion

The Brazilian Portuguese version of the DRAM questionnaire presented in the present study is valid and available for use in the clinical practice according to the criteria adopted in the literature applied to the present study.

Future research should deepen the understanding of pain perception and the impact of psychological variants on therapeutic decisions and their outcomes, besides seeking the development of precise and individualized psychometric instruments for mass application. Even more important is the engagement of physicians to include psychometric tools in the arsenal for spinal symptom assessment, in addition to clinical and imaging data in the best therapeutic institution, and especially, in outcomes assessment.

Conflict of Interests
The authors have no conflict of interests to declare.

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