CoDAS
ISSN 2317-1782 (Online version)

Original Article
Artigo Original

Translation and transcultural adaptation of the Modified Swallowing Assessment (MSA) to Brazilian Portuguese

Tradução e adaptação transcultural do Modified Swallowing Assessment (MSA) para o português brasileiro

Ana Maria Furkim[1]
Guntram Ickenstein[2†]
Marli Radke[1]
Leandro de Araújo Pernambuco[3]
Cristiane Gonçalves Montibeller[4]
Karen Fontes Luchesi[1]

Keywords

Deglutition Disorders
Stroke
Screening
Translation
Cross-Cultural Adaptation
Dysphagia

ABSTRACT

Purpose: To translate and adapt the Modified Swallowing Assessment (MSA) protocol for post-stroke patients into Brazilian Portuguese. **Methods:** This is an initial stage of the Brazilian Portuguese Modified Swallowing Assessment validation process. Translation was performed by two bilingual speech therapists and the translations synthesis evaluations by two external dysphagia experts. The synthesis version in the target language (Portuguese) was back-translated into the source language (English). After the synthesis of the translated versions, the instrument was applied to 22 post-stroke individuals. **Results:** Health professionals discussed all the results of the study stages considering the instrument concept and the target population. The semantic, linguistic and conceptual equivalences found in the translation and adaptation process were adequate, not requiring modifications since the items were consistent with the Brazilian culture. **Conclusion:** MSA was translated and adapted to Brazilian Portuguese (MSA-BR). The translation and cross-cultural adaptation process included all the items of the original protocol and maintained the standards and characteristics of the instrument.

Descritores

Transtornos de Deglutição
Acidente Vascular Encefálico
Triagem
Tradução
Adaptação Transcultural
Disfagia

RESUMO

Objetivo: Traduzir e adaptar para o português brasileiro o protocolo *Modified Swallowing Assessment (MSA*) para pacientes pós-acidente vascular cerebral. **Método:** Trata-se de uma etapa inicial do processo de validação do *Modified Swallowing Assessment* para o português brasileiro. Foi realizada a tradução por dois fonoaudiólogos bilíngues e a síntese das traduções por dois avaliadores externos, especialistas em disfagia. A versão síntese no idioma alvo (português) foi retrotraduzida para o idioma fonte (inglês). Após a síntese das versões traduzidas, o instrumento foi aplicado em 22 indivíduos com acidente vascular cerebral. **Resultados:** Os avaliadores debateram sobre todos os resultados das etapas do estudo considerando o conceito do teste e o público alvo. As discrepâncias semânticas, linguísticas e conceituais encontradas no processo de tradução e adaptação foram adequadas, para que os itens fossem compatíveis com a cultura brasileira. **Conclusão:** O MSA foi traduzido e adaptado para o português brasileiro (MSA-BR). O processo de tradução e adaptação transcultural manteve todos os itens do protocolo original, preservando-se os padrões e as características do instrumento original.

Correspondence address:
Ana Maria Furkim
Universidade Federal de Santa Catarina – UFSC
Rua Delfino Conti, s/n, Florianópolis (SC), Brasil, CEP: 88040-900.
E-mail: ana.furkim@gmail.com

Received: April 17, 2020
Accepted: August 30, 2020

Study conducted at Universidade Federal de Santa Catarina – UFSC - Florianópolis (SC), Brasil.
[1] Departamento de Fonoaudiologia, Universidade Federal de Santa Catarina – UFSC - Florianópolis (SC), Brasil
[2] Technische Universität Dresden – Dresden, German†
[3] Departamento de Fonoaudiologia, Universidade Federal da Paraíba – UFPB - João Pessoa (PB), Brasil
[4] Hospital Governador Celso Ramos – Florianópolis (SC), Brasil
†*in memorian*

Financial support: nothing to declare.
Conflict of interests: nothing to declare.

INTRODUCTION

After suffering a stroke, many patients experience changes in swallowing and speech, with neurogenic oropharyngeal dysphagia being one of the most frequent disorders[1,2]. In addition, brain injuries that cause impairment of cognitive functions can also impair swallowing control.

In addition to brain involvement, stroke can cause damage to the brain stem, impairing lips, tongue and cheeks sensitivity, increasing the response time of the swallowing pharyngeal phase, impairing laryngeal elevation, glottal closure and cricopharyngeal relaxation[3].

The presence of dysphagia has often been associated with an increase in respiratory infections and mortality[4], because it affects about 42.0% to 67.0% of patients in the first three days after a stroke[5] and 37.0% and 78.0% of these patients in general[3]. In post-stroke patients undergoing hospital rehabilitation, dysphagia was observed in 25.0% to 50.0% of the cases[6]. The importance of identifying the risk of dysphagia during the acute phase of a stroke is highlighted, in order to avoid complications and allow appropriate therapeutic interventions, enabling the individual to feed orally in an early and safe way[7].

Among the complications of dysphagia after a stroke are aspiration pneumonia, dehydration, malnutrition and decreased functional independence[6,8-10]. In a previous study[5] aspiration pneumonia associated with stroke was observed in up to 78.0% of the patients and it has also been associated to a higher mortality rate, worse functionality and longer hospital stay[9].

The use of instruments to assess swallowing is essential to prevent clinical complications and demands to be one of the priorities in health services. According to a systematic literature review[4], the publication of screening instruments for dysphagia began in 1992[11,12] and the instruments for assessing dysphagia swallowing started around 1999[4,13].

It is noteworthy that in Brazil, there is still a significant lack of instruments adapted and validated for screening laryngotracheal aspiration, which is one of the main aspects of the clinical complications of dysphagia[14]. Private institutional instruments are still widely used in Brazil, many with items based on the literature, but, without validation. Furthermore, so far, in Brazil, there are few protocols for dysphagia that underwent validation studies[14-16].

The Modified Swallowing Assessment protocol[17] is an instrument designed in Germany and published in the English language to identify the risk of dysphagia and aspiration in neurological patients[17,18]. The instrument is brief and concise. In short, it consists in obtaining patient's information, observation at rest and in action, in addition to a swallowing test with water. The instrument can be applied by the speech therapist or other health professionals and aims, especially, to reduce complications resulting from dysphagia in post-stroke patients, especially by early intervention[17,18].

This study aimed to translate and cross-culturally adapt the Modified Swallowing Assessment protocol into Brazilian Portuguese (MSA-BR).

METHODS

This is a validation study restricted to translation and cross-cultural adaptation, and was approved by the Human Research Ethics Committee of Governador Celso Ramos Hospital through CAAE62846516.1.0000.5360, under the terms of Resolution 466/2012, of the National Council of Health (CNS). All participants (patients and evaluators) signed the free and informed consent form.

Instrument

The Modified Swallowing Assessment (MSA) protocol[17] is a screening protocol for laryngotracheal aspiration for patients with neurogenic dysphagia. This protocol is divided into three parts: in the first part an interview and initial observation is carried out and, if no contraindication is found, tests are performed with water swallowing, observing the presence or absence of a clinical sign for aspiration. The instrument consists of 16 items with the possibility of a dichotomous response (yes/no). It can be applied by any health professional who has received prior training.

In the present study, the patients participated in the first stage that included a swallowing checklist of a basic approach to the level of language, cognition and oropharyngeal motor functioning (response to verbal commands; voluntary cough; secretion control; voluntary tongue movement; respiratory condition and vocal quality).

Participants who showed satisfactory competence in the six items evaluated in this checklist, proceeded to the second stage. In the second stage patients underwent the swallowing test with water in the portion of a teaspoon and swallowing aspects were observed (swallowing performance; previous escape; coughing or throat clearing; difficulty breathing; vocal quality and impressions of the patient). If competence was observed in the six items assessed, in this stage too, patients proceeded to the third stage. Finally, in the third stage, the patient should be able to swallow 90 ml of water. In order to qualify for the "pass" concept, no aspiration symptom should be observed (coughing after swallowing, choking and/or change in vocal quality up to one minute after beginning water ingestion). Any indication of airway permeation caused the patient to receive the "failure" concept.

Cross-cultural translation and adaptation

For the translation and cross-cultural adaptation from English into Brazilian Portuguese, the guidelines suggested in the literature were followed[19].

The process began with the set up, for each of the phases, of the experts' committees described below, that performed the translation, synthesis of translations, applicability of the translation synthesis/operational equivalence, back-translation or reverse translation, synthesis of the back-translated versions and final synthesis

Initially, two speech therapists with more than 20 years experience in dysphagia and in hospital settings and a nurse with more than 25 years experience with neurological patients

(Committee I) performed an analysis of the instrument as to its practical and cultural applicability.

In the translation phase, two qualified translators, native in the target language and fluent in the source language and culture (Committee II), independently translated the test, considering conceptual equivalence and avoiding literal translation.

Subsequently, the translation was synthesized in a consensual way by two natives in the target language and experienced in the source culture, specialists in dysphagia for over 20 years, with international recognition in research in the area (Committee III). Based on this consensus, a single version was built up by comparing translations and evaluating semantic, idiomatic, conceptual, linguistic and contextual discrepancies.

After the synthesis of the translations, the applicability and operational equivalence were verified, with regard to the application of the instrument in a real life context. For this phase, 22 patients diagnosed with stroke were included in a convenience sample. They were in-patients of a referral hospital in Santa Catarina State (Brazil), with a hospital stay of up to 72 hours, counting from the beginning of admission in the hospital emergency room. Within this 72 hours period, the patients could still be in the emergency room or have moved to the infirmary ward.

Unconscious patients who were not responsive to simple verbal commands and who scored below 13 in the Glasgow coma scale[20] were excluded.

In this study, the protocol was applied to the in-patients by two speech therapists from the speech therapy service of the hospital. Both professionals had more than 10 years experience in hospital care for dysphagic neurological patients and were properly trained by the authors of the new questionnaire version. In the application of the questionnaire, the paraphrase strategy was used.

After the survey, the evaluators were asked about the difficulties encountered, as well as the respondents' reactions and suggestions. A questionnaire was also used containing the following statements: "Application of the instrument is fast"; "The instrument is easily understandable by the patient"; "The instrument can be applied in any setting", with response options arranged according to a Likert-type scale[21]. This scale has options for psychometric responses where the evaluators specify their level of agreement with a statement. The evaluators could respond to one of the following options: I strongly agree, I partially agree, I strongly disagree and I partially disagree with the instrument.

For the back-translation, the final version in the target language (Brazilian Portuguese) was forwarded for review to a bilingual translator, a foreign language teacher, who has English as his mother tongue and is fluent in Brazilian Portuguese. The teacher had had no previous contact with the original version and was unaware of the instrument, so that the content consistency could be preserved.

A final synthesis in Brazilian Portuguese was obtained by comparing the original version with the translation and back-translation. The synthesis was obtained by consensus by two other speech therapists with more than 20 years experience in dysphagia and hospital settings (Committee IV). These therapists considered the equivalence in the semantic, idiomatic, conceptual, linguistic, contextual and experimental aspects in relation to the original, translated and back-translated versions.

RESULTS

The average age of the 22 participants was 59 years, all in the 72-hour post-stroke window; only two (9%) failed the Modified Swallowing Assessment (MAS-BR). The first participant who met the concept "failure" in the instrument was a woman with severe dysarthria who was unable to fulfill item "d" of phase A (tongue on upper and lower lip), while the second participant was a man who failed in phase B, in items "a" (no swallowing observed) and "c" (cough and throat clearing).

One of the issues raised by Committee I, during the process of translation and cross-cultural adaptation of the instrument, was the fact that the instrument highlighted signs of clinical aspiration, to the detriment of other signs of dysphagia. However, in sub-items "c" and "d" (Item A), phenomena that demonstrate the patient's physiological ability in relation to the oral motor sensory system are tracked, which was considered important for the stroke patients population.

Although this instrument was designed in Germany, translated and published by the original authors in the English language, Committee I did not point out any specific cultural difficulties for the application of the instrument in Brazilian Portuguese.

The conceptual, linguistic and semantic discrepancies observed after translation into Brazilian Portuguese are shown in Chart 1, while the post-back-translation discrepancies to the source language are described in Chart 2.

A few semantic, conceptual or linguistic divergences were observed at the time of translations and back-translation of the instrument; however there was no significant impairment of the objectives or applicability of the instrument.

Chart 1. Display of the Modified Swallowing Assessment (MSA) instrument items in the translation into Brazilian Portuguese versions and the translation synthesized version with their relevant discrepancies' judgment (conceptual, linguistic and semantic)

Original version	Translations 1 and 2	Synthesis version	Discrepancies
A. Swallowing Checklist (all patients)	***T1**: A – Checklist de deglutição (todos os pacientes). **T2**: A – Lista de controle da deglutição (todos os pacientes).*	*A- Rastreio da Deglutição (todos os pacientes)*	Conceptual and semantic
a. Is the patient alert and responding to speech?	***T1**: a. O paciente está alerta e respondendo a comandos? **T2**: a. O paciente está alerta e respondendo à fala?*	*a. O paciente está alerta e responde a comandos verbais?*	Semantic

Chart 1. Continued...

Original version	Translations 1 and 2	Synthesis version	Discrepancies
d. Is the patient able to lick their top and bottom lip?	***T1****: d. O paciente é capaz de passar a língua no lábio superior e inferior?* ***T2****: d. O paciente é capaz de lamber os lábios superior e inferior?*	*d. O paciente é capaz de passar a língua sobre o lábio superior e inferior?*	Semantics and linguistics
e. Is the patient able to breathe freely (i. e. has no problem in breathing without assistance and maintaining adequate oxygen saturation)?	***T1****: e. O paciente é capaz de respirar sozinho (ou seja, não tem problema para respirar sem assistência e mantém adequada saturação de oxigênio)?* ***T2****: e. O paciente é capaz de respirar espontaneamente (i.e., sem problemas respiratórios, sem assistência e mantendo a adequada saturação de oxigênio)?*	*e. O paciente é capaz de respirar espontaneamente (por ex. Não tem dificuldade para respirar sem assistência e mantêm adequada saturação de oxigênio?*	Semantic
f. Are signs of a wet- or hoarse-sounding voice absent?	***T1****: f. Há ausência de sinais como voz molhada ou rouquidão?* ***T2****: f. Os sinais de voz molhada – ou rouca – estão ausentes?*	*f. Os sinais de voz molhada e rouca estão ausentes?*	Linguistics
B- Swallowing test with 1 teaspoon of water (can only be performed if all points under 'A' are 'yes').	***T1****: B – Teste de deglutição com uma colher de chá de água sem gás (pode ser realizado se todos os pontos "A" forem "sim".* ***T2****: B – Teste de deglutição com uma colher de chá de água sem gás (poderá ser realizado somente se todos os pontos no item A forem "sim").*	*B – Teste de deglutição com uma colher de chá com água sem gás (Somente poderá ser realizada se todos os pontos do item "A" forem "sim").*	Linguistics
Mouth inspected for residues and asked to swallow saliva when prompted.	***T1****: Inspeção oral para verificar a presença de resíduos e solicitação para deglutir a saliva.* ***T2****: Boca inspecionada para resíduos e paciente solicitado a deglutir saliva.*	*Inspeção oral para resíduo e paciente solicitado para deglutir saliva*	Linguistics
Palpation of swallowing, observe for symptoms when phonation prompted.	***T1****: Verificar elevação laríngea por meio de palpação e observar alteração vocal quanto a fonação for solicitada.* ***T2****: Palpação da deglutição, observe os sintomas quando a fonação for solicitada.*	*Verificar elevação laríngea por meio de palpação e observar alteração vocal quando a fonação for solicitada.*	Conceptual and linguistics
a. No evident swallowing activity?	***T1****: a. Nenhum sinal de deglutição?* ***T2****: a. Sem evidência de atividade de deglutição?*	*a. Ausência de atividade de deglutição?*	Linguistics
b. Water leaks out of the mouth?	***T1****: b. Escape anterior de água?* ***T2****: b. A água escorre para fora da boca?*	*b. Escape oral anterior de água?*	Linguistics
c. Coughing/throat clearing?	***T1****: c. Tosse ou pigarro?* ***T2****: c. Tosse / limpa a garganta?*	*c. Tosse ou pigarro?*	Semantic
d. Increase in respiratory rate?	***T1****: d. Dificuldade de respirar?* ***T2****: d. Dificuldade na respiração?*	*d. Dificuldade para respirar?*	Semantic
E. Wet/gurgly voice within 1 minute immediately after swallowing?	***T1****: e. Voz molhada ou borbulhante após 1 minuto imediatamente após a deglutição.* ***T2****: e. Voz molhada ou borbulhante em 1 minuto imediatamente após a deglutição?*	*e. Voz molhada ou borbulhante dentro de um minuto imediatamente após a deglutição*	Semantic
a. Coughing after swallowing (within 1 min)	***T1****: a. Tosse após a deglutição (até 1 minuto).* ***T2****: a. Tosse após a deglutição? (Dentro de 1 minuto).*	*a. Tosse após a deglutição, dentro de um minuto?*	Semantic
b. Choking attacks (within 1 min)	***T1****: b. Episódios de engasgo (até 1 minuto).* ***T2****: b. Episódios de engasgos? (Dentro de 1 minuto).*	*b. Episódios de engasgo? (Dentro de um minuto após a deglutição*	Semantic
c. Change in vocal quality (within 1 min, ask to say 'Aah')	***T1****: c. Mudança na qualidade vocal (até 1 minuto, solicitar que diga "Aah").* ***T2****: c. Mudança na qualidade vocal? (Dentro de 1 minuto, solicite um /a/).*	*c. Mudança da qualidade vocal? (Dentro de um minuto após a deglutição e solicitar que diga /a/)*	Semantic and Linguistics
d. Test terminated (or unable to be performed)	***T1****: d. Teste terminado? (Ou impossibilidade de ser desenvolvido).* ***T2****: d. Teste finalizado? (Ou incapaz de ser realizado).*	*d. Teste encerrado? (Ou incapaz de ser realizado)*	Linguistics
D- MSA findings	***T1****: D – Conclusões da MSA.* ***T2****: D – Achados da MSA.*	*D – Achados da MSA*	Semantic
a. Swallowing assessment pathological in A, B or C: NO/ YES : If 'Yes', then c or d	***T1****: a) Avaliação da deglutição alterada em A, B ou C: não/sim; se "sim", então "c" ou "d" ou "e".* ***T2****: a) Avaliação da deglutição patológica em A, B ou C: Não/Sim: Se "sim", então c ou d ou e.*	*a. Alteração da deglutição em A, B ou C: não/sim: se "sim", então "c" ou "d" ou "e".*	Conceptual

Chart 1. Continued...

Original version	Translations 1 and 2	Synthesis version	Discrepancies
b. Clinical suspicion of aspiration rink: NO/ YES: If 'Yes', then c or d	***T1**: b) Suspeita clínica de risco de aspiração: não/sim: se "sim", então "c" ou "d" ou "e". **T2**: b) Suspeita clínica de risco de aspiração: Não/Sim: Se "sim", então c ou d ou e.*	*b. Suspeita clínica de risco de aspiração: não/sim: se "sim", então "c" ou "d" ou "e".*	Semantic
c. Swallowing therapist informed: NO/ YES;	***T1**: c) Fonoaudiólogo ciente: não/sim. **T2**. c) Fonoaudiólogo informado: Não/Sim.*	*c. Fonoaudiólogo informado: não/sim*	Semantic
d. Doctor informed: NO/YES	***T1**: d) Médico ciente: Não/Sim. **T2**: d) Médico informado: Não/Sim.*	*d. Médico informado: não/sim*	Semantic
e. Texture modified diet (TMD) with the help of the swallowing therapist (more options see summary SFC):	***T1**:e) Nada via oral (NVO)/Sonda nasoenteral (SNE) até avaliação com fonoaudiólogo ou médico: **T2**: e) NPO (Nada por via oral) / sonda nasogástrica (SNG) até a avaliação pelo fonoaudiólogo ou médico.*	*e. Nada por via oral (NPVO) / via alternativa de alimentação. Até a avaliação pelo fonoaudiólogo ou médico*	Semantic and conceptual

Chart 2. Exposure of the items of the Modified Swallowing Assessment (MSA) instrument in the original and back-translated versions with respective judgment of discrepancies (conceptual, linguistic and semantic) after the process of translation and adaptation to Brazilian Portuguese

Original Version	Back-translation	Discrepancy
A- Swallowing Checklist (all patients).	A- Swallowing Screening (all patients)	Semantic
a. Is the patient alert and responding to speech?	a. Is the patient alert and responsive to verbal commands?	Linguistics
b. Can the patient cough when asked to?	b. Can the patient cough when asked?	Linguistics
d. Is the patient able to lick their top and bottom lip?	d. Is the patient able to pass the tongue over the upper and lower lip?	Semantic
e. Is the patient able to breathe freely (i. e. has no problem in breathing without assistance and maintaining adequate oxygen saturation)?	d. Is the patient able to breathe spontaneously (e.g., Is there difficulty breathing without assistance and maintain adequate oxygen saturation?	Semantic
f. Are signs of a wet- or hoarse-sounding voice absent?	f. Are signs of wet and hoarse voice missing?	Semantic
Mouth inspected for residues and asked to swallowing saliva when prompted	Oral inspection for residue and patient asked to swallow saliva	Linguistics
Palpation of swallowing, observe for symptoms when phonation prompted	Verify laryngeal elevation by palpation and observe vocal alteration when phonation is requested.	Semantic
a. No evident swallowing activity?	a. Absence of swallowing activity?	Semantic
b. Water leaks out of the mouth?	b. Anterior oral escape of water?	Semantic
c. Coughing/throat clearing?	c. Cough or throat clearing?	Linguistics
d. Increase in respiratory rate?	d. Trouble breathing?	Semantic
e. Wet/gurgly voice within 1 minute immediately after swallowing?	e. Voice wet or bubbling inside of one minute immediately after swallowing	Conceptual
f. Have you doubts or a bad impression?	f. Do you have any doubts or any negative impression?	Linguistics
C- 90-mL water swallow test (can only performed if all points under 'B' are 'No').	C - Swallowing test with 90 ml of water (This can only be done if all the points in item 'B' are 'no'.	Linguistics
Functional disturbance according to Suiter & Leder criteria: Terminate assessment if 'yes' for any function.	Impaired function according to criterion of Suiter & Leder: End evaluation if there is "yes" for any function	Linguistics
a. Coughing after swallowing (within 1 min)	a. Cough after swallowing, within one minute?	Linguistics
b. Choking attacks (within 1 min)	b. Episodes of choking? (Within one minute after swallowing)	Semantic
c. Change in vocal quality (within 1 min, ask to say 'Aah')	c. Change in vocal quality? (Within one minute after swallowing and requesting to say / a /)	Semantic
d. Test terminated (or unable to be performed)	d. Test ended? (or unable to be performed)	Linguistics
a. Swallowing assessment pathological	a- Change in swallowing	Semantic
c. Swallowing therapist informed:	c- SLP therapist informed:	Conceptual
d. Doctor informed:	d- Physician informed:	Conceptual
e. Texture modified diet (TMD) with the help of the swallowing therapist (more options see summary SFC):	e. Nothing by oral pathway (NBOP) / alternative feeding pathway. By means of evaluation by SLP therapist or physician	Semantic

The application of the instrument to the 22 patients took an average of 20 minutes each and there was no report by the evaluators about difficulties regarding either the application of the instrument or the content of the items.

There was 90% agreement between the evaluators when considering the Likert-type scale answers to the questions. This percentage corresponds to the response of one of the evaluators who partially disagreed with the statement "Application of the instrument is fast". Therefore, no need to adjust the instrument translated into Brazilian Portuguese (MSA-BR) was considered.

The final version of the instrument, after translation and cross-cultural adaptation into Brazilian Portuguese, is shown in Appendix 1.

DISCUSSION

This study aimed to translate and adapt the Modified Swallowing Assessment (MSA) protocol[17] for Brazilian post-stroke patients into Brazilian Portuguese.

The lack of formal and objective instruments translated and adapted to the target culture, impact the process of dysphagia assessment and diagnosis, as well as the definition and elaboration of plans and therapeutic interventions. The use of screening instruments for dysphagia helps health professionals to identify patients who would benefit from a complete swallowing assessment. Studies indicate that screening tools must be brief, accessible, minimally invasive, low cost and should provide sensitivity and specificity in their results[22].

According to the literature, the dysphagia identification process should include tests that evaluate oral and laryngeal functions, such as increased oral transit, changes in vocal quality, inefficient involuntary cough, decreased laryngeal elevation during saliva swallowing[23]. Tests with water constitute a quick and affordable option.

The MSA protocol[17] is a tool designed for post-stroke individuals, widely used in Germany[24]. It is a standardized tool, easily understandable and applicable and low cost. Considering the instrument's characteristics and the lack of validated screening tools in Brazilian Portuguese, the importance of this protocol translation and cross-cultural adaptation is reiterated.

This cross-cultural adaptation sought to emphasize semantic equivalence, to the detriment of the literal translation of the items. As recommended by the literature, the process of translation and cross-cultural adaptation must be meticulous to maximize and preserve the levels of semantic and conceptual equivalence between the original and the target language instrument[25]. The search for maximum equivalence between the original instrument and its translated version should guide the entire process, in order to avoid distortions[26].

It is important to assess the patient's characteristics and, especially, the cognitive status before deciding to perform diagnostic investigations. Patients with cognitive impairment may be impaired in the assessment, for not understanding what the assessor is asking[22]. Neurological disorders that affect the cortical regions involved in swallowing may impair swallowing control caused by deficits in concentration or selective attention[27]. Therefore, the present instrument addresses, in its first stage, the patient's cognitive status, to verify the possibility of continuing the procedure.

Scholars argue about the present instrument's high requirement of the initial questions that exclude any patient who does not fully understand simple questions or does not perform movements voluntarily, such as specific movements of the tongue, even though it is clinically clear that it is the case of the first participant who was ascribed the "failure" concept in this study. Thus, the impression or empirical feeling is that, perhaps the patient is more sensitive than specific; this is why we emphasize the need for the instrument's validation process to continue and proceed to clarify the test's effectiveness and accuracy. It is noteworthy that, quick and validated instruments in Brazilian Portuguese are needed to refer these patients to specialized care early in the process. It is worth remembering that in connection with this instrument, should any "failure" be ascribed, the patient should be referred for a full swallowing assessment and speech therapy follow-up.

The test can only be continued if there are no clinical signs of laryngotracheal aspiration. If so, a swallowing test is performed with 90 ml of water, in a glass, in a free sip and again observing any aspiration signs. Studies on swallowing assessment use water in different volumes, such as 5 mL and 60 mL, and these tests showed sensitivity and specificity of 27.0% to 85.0% and 50.0% to 88.0%, respectively[28]. There is evidence that swallowing screening performed within 72 hours of treatment for acute stroke can prevent clinical complications from oropharyngeal dysphagia[29]. As this is only the stage of translation and cross-cultural validation of MAS-BR, unfortunately, no sensitivity and specificity values of this version are yet available.

In addition, an important literature review study with meta-analysis compared swallowing tests with water and videofluoroscopy examinations and swallowing videoendoscopy. The authors point out that there is significant scientific evidence in favor of the use of tests with consecutive sips of 90 to 100ml of water; they also recommend the observation of changes in vocal quality after swallowing (as in the instrument assessed in the present study), for the detection of aspiration risk[30].

It is noteworthy that the present study is still in progress for the second stage of the validation process, in order to obtain its accuracy data through application in post-stroke patients.

The main author of the original instrument published studies showing an excellent result in the screening of patients with dysphagia[18,29]; we expect to achieve similar results, reducing the use of antibiotic therapy, by the reduction of the aspiration pneumonia frequency.

Study limitations

We consider limitations of this study the reduced sample in the instrument applicability phase after the synthesis of the translated versions, in addition to the non-reapplication of the instrument after the final synthesis.

CONCLUSION

After the stage of translation and cross-cultural adaptation of the MSA, it was concluded that the semantic, linguistic and conceptual equivalences found during the process were satisfactory, with no major changes necessary to adjust the instrument to Brazilian Portuguese (MSA-BR).

The process of translation and cross-cultural adaptation maintained all the items of the original protocol and the standards and characteristics of the instrument. It should be pointed out that the MSA-BR continues with this research group for the assessment of the validity and reliability stages and accuracy measurements for the complete validation of the instrument.

REFERENCES

1. Mourão AM, Lemos SMA, Almeida EO, Vicente LCC, Teixeira AL. Frequency and factors associated with dysphagia in stroke. CoDAS. 2016;28(1):66-70. PMid:27074192.
2. Mituuti CT, Bianco VC, Bentim CG, de Andrade CE, Rubo JH, Berretin-Felix G. Influence of oral health condition on swallowing and oral intake level for patients affected by chronic stroke. Clin Interv Aging. 2015;10:29-35. PMid:25565784.
3. Martino R, Foley N, Bhogal S, Diamant N, Speechley M, Teasell R. Dysphagia after stroke: incidence, diagnosis, and pulmonary complications. Stroke. 2005;36(12):2756-63. http://dx.doi.org/10.1161/01.STR.0000190056.76543.eb. PMid:16269630.
4. Etges CL, Scheeren B, Gomes E, Barbosa LDR. Instrumentos de rastreio em disfagia: uma revisão sistemática. CoDAS. 2014;26(5):343-9. http://dx.doi.org/10.1590/2317-1782/20142014057. PMid:25388065.
5. Hinchey JA, Shephard T, Furie K, Smith D, Wang D, Tonn S, Stroke Practice Improvement Network Investigators. Formal dysphagia screening protocols prevent pneumonia. Stroke. 2005;36(9):1972-6. http://dx.doi.org/10.1161/01.STR.0000177529.86868.8d. PMid:16109909.
6. Ickenstein GW, Kelly PJ, Furie KL, Ambrosi D, Rallis N, Goldstein R, et al. Predictors of feeding gastrostomy tube removal in stroke patients with dysphagia. (2003). J Stroke Cerebrovasc Dis. 2003;12(4):169-74. http://dx.doi.org/10.1016/S1052-3057(03)00077-6. PMid:17903923.
7. Ickenstein GW, Clavé P, Dziewas R, Ekberg O, Höhlig C, Lindner-Pfleghar B, et al. Diagnosis and treatment of neurogenic dysphagia. Bremen: Uni-Med Verlag; 2011.
8. Tippett DC. Clinical challenges in the evaluation and treatment of individuals with poststroke dysphagia. Top Stroke Rehabil. 2011;18(2):120-33. http://dx.doi.org/10.1310/tsr1802-120. PMid:21447460.
9. Teuschl Y, Trapl M, Ratajczak P, Matz K, Dachenhausen A, Brainin M. Systematic dysphagia screening and dietary modifications to reduce stroke-associated pneumonia rates in a stroke-unit. PLoS One. 2018;13(2):e0192142. http://dx.doi.org/10.1371/journal.pone.0192142. PMid:29389984.
10. Sassi FC, Medeiros GCD, Zambon LS, Zilberstein B, Andrade CRF. Avaliação e classificação da disfagia pós-extubação em pacientes críticos. Rev Col Bras Cir. 2018;45(3):e1687. PMid:30043826.
11. DePippo KL, Holas MA, Reding MJ. Validation of the 3-oz water swallow test for aspiration following stroke. Arch Neurol. 1992;49(12):1259-61. http://dx.doi.org/10.1001/archneur.1992.00530360057018. PMid:1449405.
12. Almeida TM, Cola PC, Pernambuco LA, Magalhães HV Jr, Silva RG. Instrumentos de rastreio para disfagia orofaríngea no acidente vascular encefálico. Audiol Commun Res. 2015;20(4):361-70. http://dx.doi.org/10.1590/2317-6431-2015-1571.
13. Logemann JA, Veis S, Colangelo L. A screening procedure for oropharyngeal dysphagia. Dysphagia. 1999;14(1):44-51. http://dx.doi.org/10.1007/PL00009583. PMid:9828274.
14. Magalhães VH Jr, Pernambuco LDA, Souza LBRD, Ferreira MAF, Lima KCD. Tradução e adaptação transcultural do Northwestern Dysphagia Patient Check Sheet para o português brasileiro. CoDAS. 2013;25(4):369-74. http://dx.doi.org/10.1590/S2317-17822013000400012. PMid:24408487.
15. Sassi FC, Medeiros GC, Zilberstein B, Jayanthi SK, de Andrade CRF. Screening protocol for dysphagia in adults: comparisonwith videofluoroscopic findings. Clinics (São Paulo). 2017;72(12):718-22. http://dx.doi.org/10.6061/clinics/2017(12)01. PMid:29319716.
16. Almeida TM, Cola PC, Pernambuco LA, Magalhães HV Jr, Magnoni CD, Silva RG. Instrumento de rastreio para disfagia orofaríngea no Acidente Vascular Encefálico - Parte I: evidências de validade baseadas no conteúdo e nos processos de resposta. CoDAS. 2017;29(4):e20170009. http://dx.doi.org/10.1590/2317-1782/20172017009. PMid:28832814.
17. Ickenstein GW, Hofmayer A, Lindner-Pfleghar B, Pluschinski A, Riecker A, Schellin A, et al. Standardisation of diagnostic and therapeutic procedures for neurogenic oropharyngeal dysphagia (NOD). NeurolRehabil. 2009;15:290-300.
18. Ickenstein GW, Riecker A, Höhlig C, Müller R, Becker U, Reichmann U, et al. Pneumonia and in-hospital mortality in the context of Neurogenic Oropharyngeal Dysphagia (NOD) in stroke and a new NOD step-wise concept. J Neurol. 2010;257(9):1492-9. http://dx.doi.org/10.1007/s00415-010-5558-8. PMid:20383519.
19. Pernambuco L, Espelt A, Magalhães HV Jr, Lima KC. Recomendações para elaboração, tradução, adaptação transcultural e processo de validação de testes em Fonoaudiologia. CoDAS. 2017;29(3):e20160217. PMid:28614460.
20. Teasdale G, Knill-Jones R, van der Sande J. Observer variability in assessing impaired consciousness and coma. J Neurol Neurosurg Psychiatry. 1978;41(7):603-10. http://dx.doi.org/10.1136/jnnp.41.7.603. PMid:690637.
21. Likert R. A technique for the measurement of attitudes. Arch Sci Psychol. 1932;22(140):1-55.
22. Forster A, Samaras N, Gold G, Samaras D. Oropharyngeal dysphagia in older adults: a review. Eur Geriatr Med. 2011;2(6):356-62. http://dx.doi.org/10.1016/j.eurger.2011.08.007.
23. Logemann JA. The evaluation and treatment of swallowing disorders. Curr Opin Otolaryngol Head Neck Surg. 1998;6(6):395-400. http://dx.doi.org/10.1097/00020840-199812000-00008.
24. Ickenstein GW, Hiller M, Müller R. Management der oropharyngealen Dysphagie (OD) unter Anwendung eines standardisierten Schluckassessments im Rahmen eines Dysphagie-Management-Conceptes (DMC). Neurol & Rehabil. 2014;20(2):79-89.
25. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. Spine (Phila Pa 1976). 2000;25(24):3186-91. http://dx.doi.org/10.1097/00007632-200012150-00014. PMid:11124735.
26. Giusti E, Befi-Lopes DM. Tradução e adaptação transcultural de instrumentos estrangeiros para o Português Brasileiro (PB). Pro Fono. 2008;20(3):207-10. http://dx.doi.org/10.1590/S0104-56872008000300012. PMid:18852970.
27. Humbert IA, McLaren DG, Kosmatka K, Fitzgerald M, Johnson S, Porcaro E, et al. Early deficits in cortical control of swallowing in Alzheimer's disease. J Alzheimers Dis. 2010;19(4):1185-97. http://dx.doi.org/10.3233/JAD-2010-1316. PMid:20308785.
28. Cardoso AT, Raínho JMC, Quitério PCM, Cruz V, Magano AMO, Castro M. Avaliação clínica não-invasiva de disfagia no AVC: revisão sistemática. Rev Bras Enf. 2011;5:135-43.
29. Ickenstein GW, Höhlig C, Prosiegel M, Koch H, Dziewas R, Bodechtel U, et al. Prediction of outcome in neurogenic oropharyngeal dysphagia within 72 hours of acute stroke. J Stroke Cerebrovasc Dis. 2012;21(7):569-76. http://dx.doi.org/10.1016/j.jstrokecerebrovasdis.2011.01.004. PMid:21683618.
30. Brodsky MB, Suiter DM, González-Fernández M, Michtalik HJ, Frymark TB, Venediktov R, et al. Screening accuracy for aspiration using bedside water swallow tests: a systematic review and meta-analysis. Chest. 2016;150(1):148-63. http://dx.doi.org/10.1016/j.chest.2016.03.059. PMid:27102184.

Authors contributions

AMF contributed to the study design, analysis and interpretation of data, writing and revision of the manuscript; GI was the creator and member of the team that created the original instrument of this translation; MR contributed to the collection and tabulation of data and writing of the manuscript; LAP contributed to the study design, analysis and revision of the manuscript; CGM contributed to the data collection and revision of the manuscript; KFL contributed to the study design, collection, analysis and interpretation of data, writing and revision of the manuscript.

Appendix 1. Final version of the instrument after translation and adaptation to Brazilian Portuguese

Modified Swallowing Assessment (MSA-BR)
Identificação

Nome:	
Número do registro:	
Data de nascimento:	
Data:	
Avaliador:	

A- Rastreio da Deglutição (todos os pacientes)

Suspeita de aspiração se a resposta for "não"	Não	Sim	Comentários
a. O paciente está alerta e responde a comandos verbais?			
b. O paciente consegue tossir quando solicitado?			
c. O paciente é capaz de manter o controle da saliva?			
d. O paciente é capaz de passar a língua sobre o lábio superior e inferior?			
e. O paciente é capaz de respirar espontaneamente (por ex. Não tem dificuldade para respirar sem assistência e mantêm adequada saturação de oxigênio?			
f. Os sinais de voz molhada e rouca estão ausentes?			

B – Teste de deglutição com uma colher de chá com água sem gás (Somente poderá ser realizada se todos os pontos do item "A" forem "sim")
Paciente sentado ereto com tronco apoiado
Inspeção oral para resíduo e paciente solicitado para deglutir saliva
Verificar elevação laríngea por meio de palpação e observar alteração vocal quando a fonação for solicitada.

Comprometimento da função de acordo com critério de Perry:	Não	Sim	Comentários
Encerrar a avaliação se "houver sim" para qualquer função			
a. Ausência de atividade de deglutição?			
b. Escape oral anterior de água?			
c. Tosse ou pigarro?			
d. Dificuldade para respirar?			
e. Voz molhada ou borbulhante dentro de um minuto imediatamente após a deglutição			
f. Você tem dúvidas ou alguma impressão negativa?			

C – Teste de deglutição com 90ml de água (Somente poderá ser realizado se todos os pontos no item 'B' forem "não"

Comprometimento da função de acordo com os critérios de Suiter & Leder:	Não	Sim	Comentários
Encerrar a avaliação se "houver sim" para qualquer função			
a. Tosse após a deglutição, dentro de um minuto?			
b. Episódios de engasgo? (Dentro de um minuto após a deglutição)			
c. Mudança da qualidade vocal? (Dentro de um minuto após a deglutição e solicitar que diga /a/)			
d. Teste encerrado? (Ou incapaz de ser realizado)			

D – Achados da MAS:
a. Alteração da deglutição em A, B ou C: ( ) não ( )sim- se "sim", então "c" ou "d" ou "e".
b. Suspeita clínica de risco de aspiração: ( ) não ( ) sim- se "sim", então "c" ou "d" ou "e".
c. Fonoaudiólogo informado: ( ) não ( )sim
d. Médico informado: ( ) não ( )sim
e. Nada por via oral (NPVO) / via alternativa de alimentação. Até a avaliação pelo fonoaudiólogo ou médico
( ) não ( )sim

Comentários:
Data:
Assinatura: