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DOI: 10.15343/0104-7809.202347e13752022I

Medication Fall Risk Score and Evaluation Tools: Cross-Cultural Adaptation for Use in Brazil

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Abstract

Falls are a potential problem for all patients, especially as the risk increases in the hospital environment, regardless of the institution. Many factors may be associated with falls, including balance, which may be influenced by the use of medication. The application of an assessment scale for the risk of falls is one of the most used tools in Brazil and in the world, but it is also necessary to evaluate the medications the patient is using. The objective of this study is to carry out the cross-cultural adaptation and validation of the Medication Falls Risk Score and the Evaluation Tools for the Brazilian Portuguese language. Method: Methodological study for the cross-cultural adaptation and validation of the Medication Falls Risk Score and Evaluation Tools, using the protocol by Beaton et al. and performing the validation of the feasibility of both scales. The instruments obtained an average Content Validity Index (CVI) of 0.99, being considered valid. The validation of the feasibility of both instruments had favorable results, 65.2% of the participants found the tool easy to apply, and the average time taken to apply it was 13 minutes and 30 seconds. Among the difficulties encountered, the difficulty of recognizing the drugs in terms of their therapeutic class stands out, which justifies the difference between the time of application and the accuracy of the applied test. The tools were cross-culturally adapted to Brazilian Portuguese and demonstrated excellent agreement and practicality in healthcare settings. The approved scale and tools may serve as support for the identification, classification, and multidisciplinary care regarding the risk of falls in hospitalized patients, with the Morse Fall Scale - Brazilian version being an additional assessment.

Keywords: Accidents due to falls. Drug Related Side Effects and Adverse Reactions. Validation Studies. Patient safety. Use of Medications.

INTRODUCTION

Discussion of the topic of safety was strengthened in 2004 with the creation of the Patient Safety Program by the World Health Organization (WHO), which defined and conceptualized what patient safety would be, as well as proposed measures to reduce risks and adverse events related to care. Among these measures is the prevention of risk of falls[1,2].

Patient safety within hospital institutions also depends on the quality and safety of work by health professionals[3]. This factor was

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clearly proven in the COVID-19 pandemic situation in the world, in which the number of hospitalizations had increased, overloading care[4,5]. In Brazil, between 2019 and 2020, there were 153,126 notifications of care-related incidents; 16,053 (10.48%) were related to patient falls, among which 5.91% resulted in death in this period[6]. There was a significant increase in reports of falls and an increase in deaths due to this factor in this time interval, when compared to the year 2018[7]. In England, 247,000 falls occur in the hospital environment each year, with the most common incident in patients over 65 years of age, who are more likely to suffer injury[8]. In other words, falls are a potential problem for all patients, as this risk increases in the hospital environment, regardless of the institution[9].

A fall is defined as an unintentional displacement of the body to a level lower than the initial position, caused by multifactorial circumstances, resulting in injury or not[2]. A fall is considered when the patient is found on the floor or when, during displacement, they need support, even if they do not reach the floor[2]. There are several factors that may be associated with this risk, one of them is related to balance, which can also be influenced by the use of medications[10].

The assessment of the patient's risk of falling is essential to prescribe care and avoid injury, and prevention actions must be carried out by a multidisciplinary team[11]. This assessment must be assertive and good so that it is possible to eliminate the potential risks identified. There are different scales that can be used as tools to identify risk[12]. The Morse Fall Scale (MFS)[13], cross-culturally adapted for Brazil (MFS-B)[14], is the most explored, implemented, and adapted scale in several countries, including Brazil, as it is applicable in several scenarios and mainly in adult patients[15]. However, like the other existing scales, it also has weaknesses, such as the assessment of drugs with potential risk to the patient. As a result, those individuals who use one or more medications that increase the risk of falling can be mistakenly classified as low and moderate risk, consequently, adequate care is not provided for the actual risk[16].

Based on this fragility, a study[11] developed a scoring scale and a medication assessment tool that can increase the risk of falls in patients, called the Medication Falls Risk Score and Evaluation Tools. The development of these tools aimed to be complementary assessments after the assessment carried out by the Morse Fall Scale[11], providing a more assertive risk classification, qualified care, and involving a pharmacist in the prevention of these incidents.

The authors of the scoring scale and tool described above[11] did not validate them. However, other authors[17] in the United States, carried out the predictive validation of the scale together with the Morse Fall Scale, devising a methodology for the concomitant use of the tools. The limitations found in this study were the application of the tools only in a single moment, measuring the risk level only upon admission, and not identifying the risk factors triggered by potential future changes in hospitalization[17].

Thus, considering that the Medication Falls Risk Score and the Evaluation Tools were not cross-culturally adapted, nor validated for the Brazilian reality and that no published research was found in national journals, the hypothesis of this study was that both scales, once transculturally adapted and validated for the Brazilian Portuguese language, can be used to assess the patient's risk of falling in Brazil.

REVISTA O MUNDO DA SAÚDE

DOI: 10.15343/0104-7809.202347e13752022I

METHOD

This is a methodological study for the cross-cultural adaptation and validation of the Medication Falls Risk Score and Evaluation Tools, after obtaining authorization, via electronic contact, from the authors of the tools.

This scale consists of three scoring categories: Hight (3 points), Medium (2 points), and Low (1 point), based on a set of drug classes referenced by the American Hospital Formulary Service Class (AHFS). The final score is calculated from the sum of the points (risk level), calculated using the equation: Risk level score x Number of drugs in this risk level category. In addition to the scale, the authors present a tool that provides a set of indicators that propose factors to be analyzed from a final score above six points, namely: medications, laboratory tests, disease status/health condition, and education[11,16].

To carry out the cross-cultural adaptation, the protocol by Beaton *et al.*[18] was followed, which consists of six steps: (1) translation (English into Portuguese - T1 and T2); (2) synthesis of translations (T12); (3) back-translation (Portuguese to English – RT1 and RT2); (4) evaluation by a committee of specialists of the semantic, idiomatic, conceptual, and cultural equivalences of each translated item; (5) testing of the pre-final version; (6) feedback from the authors of the original version of the process and the result achieved[18]. At all stages, contact was maintained with the original authors of the scale, for clarification of doubts and approval of the versions. The methodological design of the steps is shown in Figure 1.

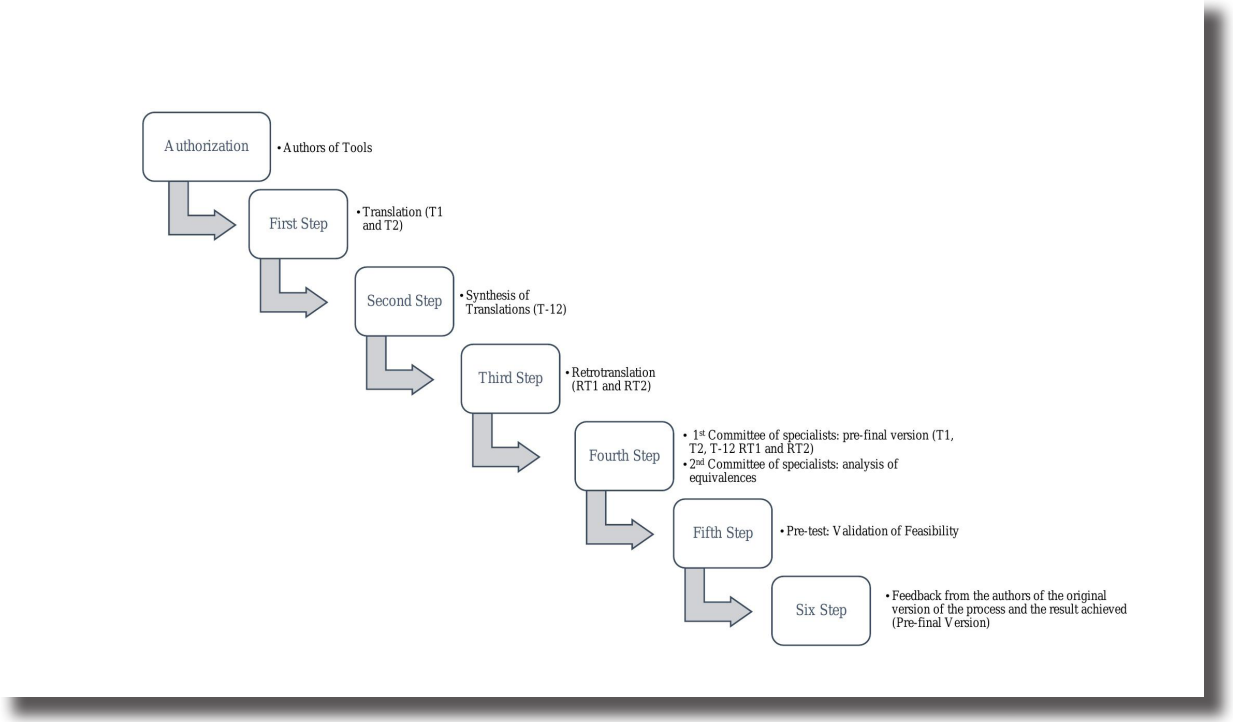

Figure 1 - Graphic representation of the stages of cross-cultural adaptation according to Beaton *et al.*[18].

DOI: 10.15343/0104-7809.202347e13752022I

In the first stage, two native Brazilian translators, with knowledge in the language of the tool, one aware of the objective of the tool and the other without knowledge about the subject of the study, translated the original English version into Portuguese, without exchanging information between each other. Each of the translators produced a translated version (T1 and T2).

In the second stage, the two versions produced (T1 and T2) were compared and synthesized by an impartial researcher, specialist in patient safety and methods improving of processes in health, invited to participate on the team. This person's role was to mediate discussions about translation differences and to produce written documentation of the process. The team, made up of the study researchers and the translators, worked from the original tool, as well as the version of the first translator (T1) and the second translator (T2), and produced a synthesis of these translations, resulting in a common translation (T-12).

The back-translation process (RT), the third step, was performed to ensure that the translated version reflects the same meaning as the original. Therefore, the T-12 version was translated back into English by two translators with no knowledge of the purpose of the tool, native English speakers, who created the RT1 and RT2 versions. The translators at this stage did not have access to the scale and the original tool, and had no training in the health field, thus avoiding information bias.

Two committees of specialists were composed for the execution of the fourth stage. The first committee consisted of a researcher with a background in the cross-cultural adaptation method, a healthcare professional specializing in patient safety and with recognized expertise in the area, a language professional, and the professionals responsible for synthesizing the translations. This team was responsible for unifying all versions (T1; T2; T-12; RT1; RT2) into a single pre-final version (in Portuguese), which would later be used in the analysis of equivalences by a second committee of experts.

For the second committee of specialists, nurses and pharmacists with academic and healthcare activities in patient safety in Brazil were selected. These professionals were selected from a virtual search on websites of public and private universities, published scientific articles, as well as official websites of projects linked to the Brazilian government on improving patient safety in Brazil. The choice of these professionals was based on their direct involvement with the medication process, mainly with medication reconciliation. In this search, 31 professionals were identified, from all regions of Brazil, active in actions for patient safety, with invitations sent via e-mail to all of them, and 12 professionals responded. This committee carried out the fourth stage, which aimed to analyze the original version and the pre-final version (T1, T2, T-12, RT1 and RT2) according to four levels of equivalence: (1) semantics (word meaning) ; (2) idiomatic (expressions and colloquialisms); (3) cultural (experiences lived in the place to which the scale is translated); and (4) conceptual (different meanings according to demographic region)[18].

Content Validation was carried out through responses regarding semantic, idiomatic, cultural, and conceptual equivalence issued by the members of the second committee of experts. For such validation, the Content Validity Index (CVI) was used, through the equation CVI = number of 3's (equivalent but needs minor changes) or 4's (absolutely equi-

Revista O Mundo da Saúde

DOI: 10.15343/0104-7809.202347e13752022I

valent) as responses on a Likert scale/total number of responses. A good concordance rate was considered to be a minimum value of 0.80 for each evaluated item[19].

This analysis was performed using a Likert-type scale (1= not equivalent, 2= impossible to assess equivalence without the item being revised, 3= equivalent but needs minor changes; and 4= absolutely equivalent), in which each of the translated items was analyzed based on the equivalences mentioned above. For all items with scores of three (3) or less, experts were asked to make considerations or suggest changes[18,19]. After this evaluation, a new meeting was held with the first committee, executor of the fourth stage, in order to qualify the cross-cultural adaptation process and adaptations of the pre-final version. Finally, this version with the adjustments and questions raised by this committee, was sent to the original authors for approval and for following the next steps.

With the feedback from the authors and having the pre-final version built and approved, the fifth and final stage began, which had the objective of evaluating the linguistic translation, evaluating the understanding of the items, as well as identifying points that still needed adjustments to ensure that the adapted version maintained its equivalence in the applied situation. This step was performed by validating the feasibility of the instrument. The feasibility of an instrument refers to the practical aspects that must be evaluated, such as the time spent to answer it and the ease of application by the subjects[20]. This validation was carried out by nurses and pharmacists with active experience in hospitals in the southern region of Brazil, since the tool requires clinical and practical knowledge for its application[11]. The recommended sample size for carrying out the pre-test, according to the cross-cultural adaptation methodology chosen in this study, was 40 healthcare professionals, including pharmacists and nurses. The southern region was chosen due to the proximity between researchers and professionals, in order to improve communication between the parties.

The feasibility test occurred from the application of the scale (pre-final version) in a case study prepared by the first committee of specialists, consisting of a clinical report and a medical prescription. Professionals were invited by email to participate. Among the 67 guests, 41 responded to the contact and participated in the final phase. The test was applied via an online form, time of application, assertiveness, as well as difficulties encountered were evaluated based on the Likert scale response with a description of its meaning, from "1" meaning I totally disagree to "5" meaning I totally agree. In the analysis of the responses, the absolute (n) and relative (%) frequency of the variables and responses to the Likert questionnaire was calculated. The higher the percentage of "partially agree" and "completely agree" responses, the greater the instrument's feasibility[21].

After the pre-test, the scale and the tool (pre-final) were reviewed again by the first committee of experts and their final version was constructed and sent to the original authors who approved the final version translated into Portuguese. The ethical aspects were respected, the cross-cultural adaptation, as well as the final version of the instruments in Portuguese were authorized by the original authors of the tool. Furthermore, the research project was approved by the Research Ethics Committee (CAEE: 39171020.8.0000.5336). Participants were informed about the research objectives and signed the Informed Consent Form (ICF).

REVISTA O MUNDO DA SAÚDE

DOI: 10.15343/0104-7809.202347e13752022I

RESULTS

The results obtained are presented starting from the six stages, as described in Table 1, revealing the original version, the synthesis of the translated version, the reverse translation, final version, and comments to the authors. These initial stages took place as proposed by the authors of the method, without particularities[18].

The professionals who participated in the fourth stage were 5 pharmacists and 7 nurses who were from the following states: Sergipe, Rio Grande do Sul, Paraná, Santa Catarina, Minas Gerais, Pernambuco, and the Federal District. The evaluations were returned within seven days, on average, after they were sent. In all, 29 items were cross-culturally adapted and evaluated by the Committee for equivalence. The average results of the Content Validity Index, by equivalence, are presented in Table 1. In general, the instruments obtained, on average, a CVI of 0.99, and are considered valid.

The pre-test was carried out based on the assessment of the instrument's feasibility, with the participation of 20 nurses and 21 pharmacists, totaling 41 professionals. The average time spent per response corresponded to 13 minutes and 30 seconds. The scale has only one correct answer for each situation, that is, the number of correct answers of participants who correctly scored the risk using the scale were analyzed. Only 45% of the nurses correctly scored the risk according to the medications present in the case's medical prescription. Among pharmacists, 75% scored correctly.

Table 2 shows the results obtained from the answers to the feasibility test using a Likert scale, with options between "1" meaning I totally disagree and "5" meaning I totally agree. Among them, 62.5% of the participants found the tool easy to apply, the others made considerations given the difficulty in understanding the instructions for use. Among the difficulties encountered, the difficulty of recognizing drugs in terms of their therapeutic class stands out.

After all the adjustments, including the analysis by the expert committee, of the considerations made in the assessment of the feasibility of the MFRS-BR, Table 2 presents the final version of the Cross-cultural Adaptation for use in Brazil.

Chart 1 - Presentation of the evolution, according to the stages of cross-cultural adaptation of the Medication Falls Risk Score (MFRS) and Evaluation Tools (ET) - Brazilian version. Porto Alegre, RS, 2021.

Instrument : Medication Falls Risk Score (MFRS) and Evaluation Tools (ET)					
Cross-cultural Adaptation: MFRS and ET- Brazilian version					
Item	**Original Version**	**Step I T1/T2 (T12)**	**Step II RT1/RT2 (RT12)**	**Final Version Post-Committee of Specialists**	**Observations sent to the original authors**
1	Medication Fall Risk Score.	*Pontuação para o risco de queda por medicamento.*	Risk score of falling for medication.	*Pontuação para o risco de queda por medicamento.*	-
2	Point Value (Risk Level).	*Pontos (nível de risco).*	Points (risk level).	*Pontos (nível de risco).*	-
3	AHSF Class: American Hospital Formulary Service Class.	AHSF Class: American Hospital Formulary Service Class.	AHSF Class: American Hospital Formulary Service Class.	AHSF Class: American Hospital Formulary Service Class.	-
4	3 (High)	*3 (Alto)*	3 (High)	*3 (Alto)*	-
5	Analgesics*, antipsychotics, anticonvulsants, benzodiazepines†.	*Analgésicos*, antipsicóticos, anticonvulsivantes, benzodiazepínicos†.*	Analgesics*, antipsychotics, anticonvulsants, benzodiazepines†.	*Analgésicos*, antipsicóticos, anticonvulsivantes, benzodiazepínicos†.*	-

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REVISTA O MUNDO DA SAÚDE

DOI: 10.15343/0104-7809.202347e13752022I

...continuation - chart 1

Instrument : Medication Falls Risk Score (MFRS) and Evaluation Tools (ET)					
Cross-cultural Adaptation: MFRS and ET- Brazilian version					
6	Sedation, dizziness, postural disturbances, altered gait and balance, impaired cognition.	*Sedação, tontura, distúrbios posturais, marcha e equilíbrio alterados, cognição prejudicada.*	Sedation, dizziness, postural disturbances, altered gait and balance, impaired cognition.	*Sedação, tontura, distúrbios posturais, marcha e equilíbrio alterados, cognição prejudicada.*	-
7	2 (Medium)	*2 (Médio)*	2 (Medium)	*2 (Médio)*	-
8	Antihypertensives, cardiac drugs, antiarrhythmics, antidepressants.	*Anti-hipertensivos, medicamentos cardíacos, antiarrítmicos, antidepressivos.*	Antihypertensives, cardiac drugs, antiarrhythmics, antidepressants.	*Anti-hipertensivos, medicamentos cardíacos, antiarrítmicos, antidepressivos.*	-
9	Induced orthostasis, impaired cerebral perfusion, poor health status.	*Perturbações da ortostasia, perfusão cerebral alterada, condição de saúde precária.*	Induced orthostasis, impaired cerebral perfusion, poor health state.	*Comprometimento da ortostasia, perfusão cerebral alterada, condição precária de saúde.*	The term "commitment of orthostasis" was chosen, as the initial translation "orthostasis disturbances" is not usual in Brazil, as well as the term "condition of precarious health" being chosen as "precarious health condition".
10	1 (Low)	*1 (Baixo)*	1 (Low)	*1 (Baixo)*	-
11	Diuretics.	*Diuréticos.*	Diuretics.	*Diuréticos.*	-
12	Increased ambulation, induced orthostasis.	*Aumento da deambulação, comprometimento da ortostasia.*	Increased ambulation, orthostatic disorders.	*Aumento da deambulação, comprometimento da ortostasia.*	-
13	Score ≥ 6	*Pontuação ≥ 6*	Score ≥ 6	*Pontuação ≥ 6*	-
14	Higher risk for fall; evaluate patient.	*Maior risco de queda: avaliar o paciente.*	Higher risk for fall; evaluate patient.	*Maior risco de queda: avaliar o paciente.*	-
15	* Includes opiates.	* *Incluir opiáceos.*	* Includes opiates	* *Incluir opiáceos.*	-
16	Although not included in the original scoring system, the falls tool kit team recommends that you include nonbenzodiazepine sedative-hypnotic drugs (e.g., zolpidem) in this category.	† *incluir medicamentos sedativo-hipnóticos não benzodiazepínicos (p.ex., zolpidem).*	Although not included in the original scoring system, the falls tool kit team recommends that you include nonbenzodiazepine sedative-hypnotic drugs (e.g., zolpidem) in this category.	† *incluir medicamentos sedativo-hipnóticos não benzodiazepínicos (p.ex., zolpidem).*	Recommended by ARQH (Agency for Healthcare Research and Quality)[16]
17	Medication Fall Risk Evaluation Tools.	*Ferramentas para avaliação do risco de queda por medicamento.*	Tools for evaluation of risk of falling for medication.	*Ferramentas para avaliação do risco de queda por medicamento.*	-
18	Indicator.	*Indicador.*	Indicator.	*Indicador.*	-
19	Comments.	*Comentários.*	Comments.	*Comentários.*	-
20	Medications.	*Medicamentos.*	Medications.	*Medicamentos.*	-
21	Beers criteria, dose adjustment for renal function or disease state, over utilization of medications, IV access.	*Critérios de Beers, ajuste de dose para função renal ou estado da doença, uso excessivo de medicamentos, acesso EV.*	Beers criteria, dose adjustment for renal function or disease state, over use of medications, IV access.	*Critérios de Beers, ajuste de dose para função renal ou estado da doença, uso excessivo de medicamentos, acesso EV.*	-
22	Laboratory.	*Laboratório.*	Laboratory.	*Laboratório.*	-

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Revista O Mundo da Saúde

DOI: 10.15343/0104-7809.202347e13752022I

...continuation - chart 1

Instrument : Medication Falls Risk Score (MFRS) and Evaluation Tools (ET)					
Cross-cultural Adaptation: MFRS and ET- Brazilian version					
23	Therapeutic drug levels (digoxin, phenytoin), INR, electrolytes, Hgb/ HCT.	*Índices terapêuticos dos medicamentos (digoxina, fenitoína), RNI, eletrólitos, Hgb/HTC.*	Therapeutic levels of drugs (digoxin, phenytoin), INR, electrolytes, Hgb/HCT.	*Índices terapêuticos dos medicamentos (digoxina, fenitoína), RNI, eletrólitos, Hgb/HTC.*	-
24	Disease states	*Estado da doença Condição de saúde.*	Disease Status/ Health Condition.	*Estado da doença Condição de saúde.*	Incluímos o termo "Condição de Saúde" para facilitar o entendimento em português do "Disease States" que traduzido é "Estado da doença".
25	Comorbidities, HTN, CHF, DM, orthopedic surgery, prior fall, dementia, other a.	*Comorbidades, HAS, ICC, DM, cirurgia ortopédica, queda anterior, demência, outros a.*	Comorbidities, SAH, ICC, DM, orthopedic surgery, previous fall, dementia, others – a.	*Comorbidades, HAS, ICC, DM, cirurgia ortopédica, queda anterior, demência, outros a.*	-
26	Education.	*Educação.*	Education.	*Educação.*	-
27	Patient'sability/ Willing ness to learn, patient's mental status.	*Habilidade/prontidão do paciente de aprender, estado mental do paciente.*	Patient's ability/ willingness to learn, patient's mental state.	*Habilidade/prontidão do paciente de aprender, estado mental do paciente.*	-
28	*Age 65 years or older; IV = intravenous; INR = international normalizedratio; Hgb = hemoglobin; HCT = hematocrit; HTN = hypertension; CHF = congestive heart failure; DM = diabetes.	**Idade 65 anos ou mais; EV = endovenoso; RNI = razão normalizada internacional; Hgb = hemoglobina; HTC = hematócritos; HAS = hipertensão arterial sistêmica; ICC = insuficiência cardíaca congestiva; DM = diabetes.*	*age 65 andolder; IV = intravenous; INR = international normalizedratio; Hgb = hemoglobin; HCT = hematocrit; SAH = systemic arterial hypertension; CHF = congestive heart failure; DM = diabetes.	**Idade 65 anos ou mais; EV = endovenoso; RNI = razão normalizada internacional; Hgb = hemoglobina; HTC = hematócritos; HAS = hipertensão arterial sistêmica; ICC = insuficiência cardíaca congestiva; DM = diabetes.*	-
29	How to use this tool: Addup the point value (risk level) for every medication the patient is taking. If the patient is taking more than one medication in a particular risk category, the score should be calculated by (risk level score) x (number of medications in that risk level category).	*Como utilizar esta ferramenta: Some o valor dos pontos (nível de risco) para cada medicamento que o paciente esteja usando. Caso o paciente esteja fazendo uso de mais de um medicamento em uma determinada categoria de risco, a pontuação deverá ser calculada utilizando-se (pontuação do nível de risco) x (número de medicamentos nessa categoria de nível de risco).*	How to use this tool: Addup the point value (risk level) for every medication the patient is taking. If the patient is taking more than one medication in a particular risk category, the score should be calculated by (risk level score) x (number of medications in that risk level category).	*Como utilizar esta ferramenta: Some o valor dos pontos (nível de risco) para cada medicamento que o paciente esteja usando. Caso o paciente esteja fazendo uso de mais de um medicamento em uma determinada categoria de risco, a pontuação deverá ser calculada utilizando-se (pontuação do nível de risco) x (número de medicamentos nessa categoria de nível de risco). Todos os medicamentos prescritos devem ser considerados.*	Instrução de uso retirado na ARQH (Agency for Healthcare Research and Quality)[16]

I version: EV = endovenoso; IV = intravenous; RNI = razão normalizada internacional; INR = international normalized ratio; Hgb = hemoglobina; Hgb = hemoglobin; HTC = hematócritos; HTC = hematocrit; HAS = hipertensão arterial sistêmica; SAH = systemic arterial hypertension; ICC = insuficiência cardíaca congestiva; CHF = congestive heart failure; DM = diabetes; DM = diabetes.
Source: Research data, 2021.

P version: EV = endovenoso; RNI = razão normalizada internacional; Hgb = hemoglobina; HTC = hematócritos; HAS = hipertensão arterial sistêmica; ICC = insuficiência cardíaca congestiva; DM = diabetes.
Fonte: Dados da pesquisa, 2021.

REVISTA O MUNDO DA SAÚDE

DOI: 10.15343/0104-7809.202347e13752022I

Table 1 - Description of the Content Validity Index resulting from the analysis of the semantic, idiomatic, cultural, and conceptual equivalence of the Medication Falls Risk Score (MFRS) and the Medication Fall Risk Evaluation Tools (ET), in the Brazilian Portuguese version, by the judges of the expert committee. Porto Alegre, RS, 2021.

Equivalencies	CVI Medication Fall Risk Score – Brazilian version	CVI Medication Fall Risk Evaluation Tools – Brazilian version	Mean CVI
Semantic	0.98	0.99	0.99
Idiomatic	0.98	0.99	0.99
Cultural	1	0.98	0.99
Conceptual	1	0.99	0.99
Mean CVI	0.99	0.99	0.99

*CVI: Content Validity Index

Source: Research data, 2021.

Table 2 - Results obtained in evaluating the feasibility of applying the Medication Falls Risk Score (MFRS-BR) and the Medication Fall Risk Evaluation Tools (ET-BR), in the Brazilian Portuguese version. Porto Alegre, RS, 2021. (n=41).

Questions for assessing the feasibility of MFRS-BR and ET-BR	Totally Disagree n (%)	Partially Disagree n (%)	I have no opinion n (%)	Partially Agree n (%)	Totally Agree n (%)
I found it easy to understand the instrument's instructions.	2 (5)	3 (7.5)	-	10 (25)	26 (62.5)
I found it easy to understand the filling of the instrument.	1 (2.5)	2 (45)	-	5 (12.5)	33 (80)
I found it easy to mark the questions on the instrument.	-	1 (2.5)	-	1 (2.5)	39 (95)

Source: Research data, 2021.

Chart 2 – Final Version of the Medication Fall Risk Score (MFRS-BR) and Evaluation Tools (ET-BR) in the Brazilian Portuguese version. Porto Alegre, RS. 2021.

Medication Fall Risk Score (MFRS-BR)		
Points (risk level)	AHSF Class: American Hospital Formulary Service Class	Commentaries.
3 (High)	Analgesics*, antipsychotics, anticonvulsants, benzodiazepines†	Sedation, dizziness, postural disturbances, altered gait and balance, impaired cognition.
2 (Medium)	Antihypertensives, cardiac medications, antiarrhythmics, antidepressants	Compromised orthostasis, altered cerebral perfusion, precarious health condition.
1 (Low)	Diuretics	Increased ambulation, impairment of orthostasis.
Score ≥ 6		Greater risk of falling: assess the patient.

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Revista O Mundo da Saúde

DOI: 10.15343/0104-7809.202347e13752022I

... continuation - chart 2

Medication Fall Risk Score (MFRS-BR)		
How to use this tool: Add up the point value (risk level) for each drug the patient is taking. If the patient is taking more than one drug in a given risk category, the score should be calculated using (risk level score) x (number of drugs in that risk level category). **All prescription medications should be considered.**		
Medication Fall Risk Evaluation Tools (ET-BR)	-	-
Indicator	Comments	-
Medicines	Beers criteria, dose adjustment for renal function or disease state, medication overuse, IV access	-
Laboratory	Therapeutic indices of drugs (digoxin, phenytoin), INR, electrolytes, Hgb/HTC	-
Disease State/	Comorbidities, SAH, CHF, DM, orthopedic surgery, previous fall, dementia, others[a]	-
Health Condition	Patient's ability/readiness to learn, patient's mental state	-

[a]Age 65 years or older; IV = intravenous; INR = international normalized ratio; Hgb = hemoglobin; HTC = hematocrit; SAH = systemic arterial hypertension; CHF = congestive heart failure; DM = diabetes.
*Include opiates † include non-benzodiazepine sedative-hypnotic drugs (eg, zolpidem)
Source: Research data, 2021.

DISCUSSION

Understanding that measurement instruments are part of clinical practice, in different areas of knowledge, the assessment of their reliability and validity becomes essential for them to provide valid and reliable measurements. The quality of the information provided by the instruments is achieved by following a robust method[18].

The scale "Medication Fall Risk Score (MFRS-BR)" and the "Medication Fall Risk Evaluation Tool (ET-BR)", in the Brazilian Portuguese version, had a good evaluation at the level of equivalence by the second committee of specialists, composed of professionals from several states of Brazil, which contributed to broaden the analysis and delivery of a version that meets the various cultural realities of this country. Although it was observed that the scale is understandable, in the validation of practicability, there was yet a variation in the time for application among the participants and decisiveness in the risk score in the case study, since the scale evaluates the number of medications, having a single answer for each patient. The difference between application time and correctness is explained by the participants themselves by reporting a lack of knowledge about the therapeutic classes of drugs. One study showed the concern of nurses to learn more about pharmacology, as they understand that the content presented in their undergraduate course was not enough[22]. To aid in the use of tools, artificial intelligence systems can be used to perform the therapeutic classification of drugs based on the medical prescription. The implementation of

Revista O Mundo da Saúde

DOI: 10.15343/0104-7809.202347e13752022I

these technological innovations are increasingly present in the Brazilian healthcare system, being driven by the COVID-19 pandemic[23].

Medication can be classified by their mechanism of action and/or therapeutic use[24], and thus a drug can be classified into one or more therapeutic classes. However, the scale will score according to the pharmacotherapeutic classification by the action and adverse events that the medication can provide[11]. An example of this dual possibility are diuretics, which can be classified as cardiac medications, but the main adverse effect, related to falls, is urinary urgency, leading to increased walking and volume depletion, and hydroelectrolytic disorders, triggering orthostatic hypotension, characterizing and classifying it as a diuretic. The tools were developed from the AHSF Class: American Hospital Formulary Service Class; therefore, for their application, the pharmacotherapeutic classification of the drugs present in this form must be followed.

Another difficulty found was related to the inclusion of drugs prescribed as "if necessary" and "at the physician's discretion", as well as drugs used by the patient at home. Medication reconciliation aims to avoid medication-related errors, such as duplication and omission, within the hospital environment, from admission, transfer of care, and discharge[25]. It is an essential practice to avoid biases in results from the application of MFR-S-BR, identifying all drugs used or potentially used by the patient and that may cause risk. The medications that can be used are also those prescribed as "if necessary" and/or "at the physician's discretion"[26]. Thus, all medications present in the medical prescription must be considered for scoring on the scale, as they can cause adverse reactions when administered, which may trigger the patient to fall. Therefore, the scale was updated, including the observation "All prescription drugs must be considered".

CONCLUSION

The MFRS and ET were cross-culturally adapted for use in Brazil, after carefully following all stages of the chosen method. Content validation through the analysis of semantic, idiomatic, conceptual, and cultural equivalence and the analysis of feasibility in the follow-up showed an excellent agreement and feasibility of use in practice in healthcare scenarios. The approved scale and tool can serve to support the identification, classification, and multidisciplinary care regarding the risk of falls in hospitalized patients, with an additional and collaborative evaluation of the Morse Fall Scale - Brazilian version.

The analysis of drugs to compose MFRS-BR remains a challenge for health professionals, including pharmacists, since the wide range of drugs and the possibility of including them in more than one therapeutic class could be a confounding factor when choosing the risk level.

The risk of falls is related to a broad set of associations that must be analyzed to establish a patient's risk of falls in the hospital environment. Medications are one of the contributing factors to the increased risk. The classification and association of adverse drug events should be evaluated more frequently in clinical care. Interprofessional and collaborative work, with the involvement of the pharmacist, is essential for this evaluation, which can contribute assertively to education about medications and care with their

DOI: 10.15343/0104-7809.202347e13752022I

administration, both for patients and for the multidisciplinary teams, reinforcing and suggesting clinical and care behaviors, promoting patient safety.

Author Statement CREdiT

Conceptualization: Eckert, VCR; Millao, LF; Urbanetto, JS. Methodology: Eckert, VCR; Millao, LF; Urbanetto, JS. Validation: Eckert, VCR; Millao, LF; Urbanetto, JS. Statistical analysis: Eckert, VCR; Millao, LF; Urbanetto, JS. Formal analysis: Eckert, VCR; Millao, LF; Urbanetto, JS. Investigation: Eckert, VCR; Millao, LF; Urbanetto, JS. Features: Eckert, VCR; Millao, LF; Urbanetto, JS. Preparation of original written draft: Eckert, VCR; Millao, LF; Urbanetto, JS. Writing-reviewing and editing: Eckert, VCR; Millao, LF; Urbanetto, JS. Visualization: Eckert, VCR; Millao, LF; Urbanetto, JS. Supervision: Eckert, VCR; Millao, LF; Urbanetto, JS. Project management: Eckert, VCR; Millao, LF; Urbanetto, JS.

All authors read and agreed with the published version of the manuscript.

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REVISTA O MUNDO DA SAÚDE

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Received: 29 july 2022.
Accepted: 13 march 2023.
Published: 21 june 2023.