O *Rivermead Mobility Index* é o instrumento de medida mais completo para avaliar a mobilidade funcional no AVC: *scoping review* e revisão sistemática

The Rivermead Mobility Index is the most comprehensive measurement instrument to evaluate functional mobility in stroke: scoping review and systematic review

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Resumo

Introdução: O Acidente Vascular Cerebral (AVC) é a principal causa de incapacidade a longo prazo da população mundial. As alterações estruturais e funcionais consequentes da condição contribuem para a redução da mobilidade funcional (MF), tornando-se fundamental a sua avaliação com instrumentos de medida (IM) adequados e fundamentados, permitindo uma prática clínica mais objetiva e rigorosa. **Objetivos**: Investigar qual(is) o(s) instrumento(s) de medida mais completo(s), do ponto de vista das categorias da Classificação Internacional de Funcionalidade (CIF) abrangidas que, segundo a literatura, avalia(m) a MF no indivíduo adulto com sequelas de AVC, e rever na literatura as propriedades psicométricas desse(s) instrumento(s). **Material e Métodos**: Realizou-se duas pesquisas bibliográficas nas bases de dados PubMed, EBSCO, CENTRAL, PEDro, Web of Science, Science Direct e Wiley Online Library. O estudo foi dividido em duas partes principais, nomeadamente a elaboração de uma *Scoping Review* dos IM que avaliam a MF e uma Revisão Sistemática das propriedades psicométricas do IM com mais correspondências com a CIF. **Resultados**: Na *Scoping Review* foram incluídos 120 estudos, o *Rivermead Mobility Index* (RMI) foi o IM que apresentou mais correspondências com as categorias CIF incluídas na definição de MF. Na Revisão Sistemática, dos 11 estudos encontrados, verificou-se bons resultados na validade, fidedignidade e sensibilidade do RMI. **Conclusões**: O RMI mostra ser o IM mais completo na correspondência com as categorias CIF incluídas na definição de MF. Recomenda-se a utilização do RMI como IM da MF em utentes com AVC, pelas boas propriedades psicométricas que apresentam.

Palavras-chave: Acidente Vascular Cerebral (AVC), Mobilidade Funcional (MF), Classificação Internacional da Funcionalidade (CIF), Instrumentos de medida (IM), R*ivermead Mobility Index* (RMI).

Abstract

Introduction: Stroke is the leading cause of long-term disability in the global population. The structural and functional changes resulting from the condition contribute to the reduction of functional mobility (FM), making it essential to evaluate it with appropriate and grounded measurement instruments (MI), enabling a more objective and rigorous clinical practice. **Objectives:** To investigate which measurement instrument(s) is/are the most comprehensive, from the point of view of the International Classification of Functioning (ICF) categories covered, that, according to the literature, assess(es) FM in the adult individual with sequelae of stroke, and to review in the literature the psychometric properties of this/these instrument(s). **Material and Methods:** Two literature searches were conducted on the PubMed, EBSCO, CENTRAL, PEDro, Web of Science, Science Direct, and Wiley Online Library databases. The study was divided into two main parts, namely the elaboration of a Scoping Review of MI that assess FM and a Systematic Review of the psychometric properties of MI with more correspondences with the ICF. **Results**: In the Scoping Review, 120 studies were included, and the Rivermead Mobility Index (RMI) was the MI that presented the most correspondences with the ICF categories included in the definition of FM. In the Systematic Review, of the 11 studies found, good results were found in the validity, reliability, and sensitivity of the RMI. **Conclusions**: The RMI appears to be the most comprehensive MI in correspondence with the ICF categories included in the definition of FM. The use of RMI is recommended as an FM MI in stroke patients, due to its good psychometric properties.

Keywords: Stroke, Functional Mobility (FM), International Classification of Functioning (ICF), Measurement Instruments (MI), Rivermead Mobility Index (RMI).

1. INTRODUÇÃO

O Acidente Vascular Cerebral (AVC) é uma condição neurológica de grande incidência nos países desenvolvidos e a principal causa de incapacidade a longo prazo na população mundial. Cerca de 1/3 dos sobreviventes de AVC apresentam défices motores permanentes, presentes nos membros inferiores, superiores e/ou tronco, que podem estar acompanhadas de alterações cognitivas e/ou comportamentais, dependendo da área do cérebro afetada (Caro et al., 2018) e que, consequentemente, podem afetar as suas atividades da vida diária (AVD) (Huo et al., 2019).

O dano neural consequente do AVC provoca geralmente limitação ou perda unilateral da função muscular (hemiparesia ou hemiplegia) (Balaban and Tok, 2014), repercutindo-se em alterações funcionais do sistema neuromuscular, compromisso da propriocepção, padrões anormais de ativação muscular e alterações no controlo postural (Azzollini et al., 2021). Todas estas alterações funcionais contribuem para a redução da mobilidade e incapacidade funcional dos utentes pós-AVC, sendo que cerca de 25% a 35% das pessoas apresentam uma percentagem elevada de quedas após a ocorrência do mesmo. Este facto deve-se à alteração do equilíbrio que compromete a mobilidade e as transferências de peso, influenciando a capacidade dos indivíduos em realizar a marcha de forma adequada e segura (Karthikbabu et al., 2018). Desta forma, a diminuição da mobilidade funcional demonstra ser um dos principais problemas desta população, tendo um grande impacto na sua qualidade de vida (Buvarp et al., 2020).

A Mobilidade Funcional (MF) define-se como a capacidade fisiológica de um indivíduo se mover de forma independente e segura em diversos ambientes, permitindo a execução de tarefas funcionais e, por conseguinte, a realização das AVD, em casa, no trabalho e na comunidade (Forhan and Gill, 2013). As três grandes áreas incluídas na MF são: mobilidade no leito, que se caracteriza como a capacidade de se mover na cama, incluindo ações como o rolar, desviar e movimentar de sentado para deitado, e vice-versa; transferências, que são descritas como a ação de se movimentar de uma superfície para outra, e que inclui transferir-se de uma cama para uma cadeira, ou de uma cadeira para outra; e deambulação, que é definida como a capacidade de andar, e inclui a assistência de terceiros, ou a assistência de dispositivos (Bouça-Machado et al., 2018). Esta definição não se encontra presente na Classificação Internacional de Funcionalidade (CIF), que consiste numa ferramenta criada pela Organização Mundial de Saúde (OMS), cujo principal objetivo passa por proporcionar uma linguagem comum e padronizada na descrição das diferentes componentes e estados relacionados com a saúde, de forma a melhorar a comunicação entre os diversos usuários, nomeadamente profissionais de saúde (WHO, 2001). Embora a CIF tenha sido desenvolvida com o objetivo principal de fornecer uma linguagem comum para a comunicação entre profissionais de saúde, estabeleceu-se também como uma ferramenta abrangente e útil para avaliar a mobilidade funcional e outros aspetos da saúde. A CIF fornece uma estrutura que permite uma descrição detalhada das várias dimensões que influenciam a funcionalidade, incluindo funções corporais, limitações da atividade e restrições da participação. Além disso, existem muitos instrumentos de medida que podem ser usados em conjunto com a CIF para avaliar a funcionalidade e outros aspetos da saúde,

1. INTRODUCTION

Stroke is a neurological condition of high incidence in developed countries and the leading cause of long-term disability in the world population. About 1/3 of stroke survivors present permanent motor deficits in the lower and/or upper limbs and/or trunk, which may be accompanied by cognitive and/or behavioural changes depending on the affected area of the brain (Caro et al., 2018), and therefore can affect their activities of daily living (ADL) (Huo et al., 2019).

The neural damage caused by stroke generally leads to unilateral loss or limitation of muscle function (hemiparesis or hemiplegia) (Balaban and Tok, 2014), resulting in functional alterations of the neuromuscular system, impairment of proprioception, abnormal patterns of muscle activation, and changes in postural control (Azzollini et al., 2021). All these functional alterations contribute to the reduction of mobility and functional disability of post-stroke patients, and approximately 25% to 35% of people have a high percentage of falls after a stroke. This is due to the balance impairment, which compromises mobility and weight transfer, influencing the ability of individuals to walk appropriately and safely (Karthikbabu et al., 2018). Thus, the decrease in functional mobility proves to be one of the main problems of this population, having a significant impact on their quality of life (Buvarp et al., 2020).

Functional Mobility (FM) is defined as the physiological capacity of an individual to move independently and safely in various environments, allowing the execution of functional tasks and, consequently, the performance of ADLs at home, work, and in the community (Forhan and Gill, 2013). The three major areas included in FM are bed mobility, which is characterized as the ability to move in bed, including actions such as rolling, shifting, and moving from sitting to lying down and vice versa; transfers, which are described as the action of moving from one surface to another, including transferring from a bed to a chair or from one chair to another; and ambulation, which is defined as the ability to walk, and includes the assistance of others or the use of devices (Bouça-Machado et al., 2018). This definition is not present in the International Classification of Functioning (ICF), which is a tool created by the World Health Organization (WHO) with the main objective of providing a common and standardized language in the description of different components and health-related states, in order to improve communication between different users, including healthcare professionals (WHO, 2001). Although the ICF was developed with the main objective of providing a common language for communication between healthcare professionals, it has also become a comprehensive and useful tool for assessing functional mobility and other aspects of health. The ICF provides a framework that allows for a detailed description of the various dimensions that influence functionality, including bodily functions, activity limitations, and participation restrictions. In addition, there are many measurement instruments that can be used in conjunction with the ICF to assess functionality and other aspects of health, such as the Pediatric Evaluation of Disability Inventory (PEDI) and the Functional Independence Measure (FIM) (Lohmann et al., 2011).

Changes in FM caused by stroke are considered a major

tais como a Escala de Mobilidade Pediátrica (PEDI) e a Medida de Independência Funcional (MIF) (Lohmann et al., 2011).

As alterações na MF provocadas pelo AVC são consideradas um grande problema, resultando em quedas e na dependência de terceiros. A recuperação da MF é de grande interesse clínico no que diz respeito ao planeamento e à implementação de planos de tratamento em fisioterapia (Buvarp et al., 2020).

Atendendo à relevância da MF em indivíduos com sequelas de AVC, torna-se fundamental a sua avaliação com Instrumentos de Medida (IM) adequados, permitindo uma prática clínica mais objetiva e rigorosa. O processo de decisão e discriminação do instrumento deve ter como base as suas propriedades psicométricas de validade, fidedignidade e sensibilidade (Echevarría-Guanilo et al., 2018). A COSMIN (*COnsensus-based Standards for the selection of health Measurement INstruments*) vai ao encontro dessa avaliação, fornecendo suporte metodológico na seleção do(s) instrumento(s) de medida mais adequado(s) para a prática clínica e investigação (Prinsen et al., 2018).

Relativamente aos instrumentos de medida na avaliação da MF nesta população, o teste *Timed Up-and-Go* (TUG) e o *Rivermead Mobility Index* (RMI) estão descritos na literatura como os IM mais utilizados (Silva et al., 2020b). No entanto, ainda não há evidência quanto ao IM que engloba mais componentes da mobilidade funcional em indivíduos que sofreram um AVC. Deste modo, com este estudo pretendeu-se investigar qual(is) o(s) instrumento(s) de medida mais completo(s), do ponto de vista das categorias da CIF abrangidas que, segundo a literatura, avalia(m) a MF no indivíduo adulto com sequelas de AVC, e rever na literatura as propriedades psicométricas desse(s) instrumento(s).

2. MATERIAL E MÉTODOS

Tendo em conta os objetivos de investigação, o presente estudo foi dividido em duas partes principais:

1. Com o intuito de determinar qual(ais) o(s) instrumento(s) de medida mais completo(s) para avaliar a MF em casos de AVC usou-se a seguinte metodologia:
   a. Correspondência da definição de MF com as categorias CIF segundo um painel de peritos, obtido através da aplicação de um questionário;
   b. Elaboração de uma Scoping Review dos Instrumentos de Medida (IM) que avaliam a MF para determinar quais os instrumentos que existem na literatura científica com esse fim;
   c. Correspondência dos IM com as categorias CIF, de forma a averiguar qual o instrumento que contempla mais dessas categorias.
2. Com o intuito de rever na literatura as propriedades psicométricas do instrumento escolhido, fez-se uma Revisão Sistemática.

2.1. QUAL O(S) INSTRUMENTO(S) DE MEDIDA MAIS COMPLETO(S) PARA AVALIAR A MF EM CASOS DE AVC?

2.1.1. CATEGORIAS CIF E CONSULTA A PERITOS

Para validar as categorias da CIF que melhor se incluíam na definição de mobilidade funcional (MF), foi convocado um painel de peritos para participar de um processo de validação em duas rondas. Foram identificados 11 potenciais peritos com

problem, resulting in falls and dependence on caregivers. The recovery of FM is of great clinical interest regarding the planning and implementation of treatment plans in physiotherapy (Buvarp et al., 2020).

Given the relevance of FM in individuals with stroke sequelae, it is essential to evaluate it with adequate Measurement Instruments (MI), allowing for a more objective and rigorous clinical practice. The decision-making and discrimination process of the instrument should be based on its psychometric properties of validity, reliability, and sensitivity (Echevarría-Guanilo et al., 2018). COSMIN (COnsensus-based Standards for the selection of health Measurement INstruments) meets this evaluation, providing methodological support in the selection of the most appropriate MI(s) for clinical practice and research (Prinsen et al., 2018).

Regarding measurement instruments in the evaluation of FM in this population, the Timed Up-and-Go (TUG) test and the Rivermead Mobility Index (RMI) are described in the literature as the most used MIs (Silva et al., 2020b). However, there is still no evidence regarding the MI that encompasses more components of FM in individuals who have suffered a stroke. Therefore, this study aimed to investigate which measurement instrument(s) is/are the most comprehensive, from the perspective of the ICF categories covered, which according to the literature, evaluate(s) FM in adults with stroke sequelae, and to review the psychometric properties of this/these instrument(s) in the literature.

2. MATERIALS AND METHODS

Considering the research objectives, the present study was divided into two main parts:

1. In order to determine which MI(s) is/are the most complete for assessing FM in cases of stroke, the following methodology was used:
   a. Correspondence of the definition of FM with the ICF categories according to a panel of experts, obtained through a questionnaire;
   b. Scoping Review of MI that assess FM to determine which instruments exist in the scientific literature for this purpose;
   c. Correspondence of the MI with the ICF categories to determine which instrument includes more of these categories.
2. In order to review the psychometric properties of the chosen instrument in the literature, a Systematic Review was conducted.

2.1. WHAT IS THE MOST COMPLETE MI(S) FOR EVALUATING FM IN STROKES?

2.1.1. ICF CATEGORIES AND EXPERT CONSULTATION

To validate the International Classification of Functioning, Disability and Health (ICF) categories that best fit the definition of FM, a panel of experts was convened to participate in a two-round validation process. Eleven potential experts with experience in the area of FM and/or stroke were identified, and a questionnaire was sent via email. The questionnaire included a proposal of 29 ICF categories that could be included in the

experiência na área da MF e/ou do AVC, aos quais foi enviado um questionário via e-mail. O questionário continha uma proposta de 29 categorias CIF que poderiam estar abrangidas na definição de MF. Os peritos foram solicitados a responder se consideravam que a categoria CIF estava ou não estava contemplada na definição, além de ter um campo de resposta para sugerir se havia alguma outra categoria da CIF que, na opinião do perito, deveria ser incluída.

Após a primeira ronda de validação, 8 peritos (conforme apresentado na Tabela 1) responderam ao questionário e foi considerado consenso, ou seja, categoria da CIF a incluir no estudo, quando a concordância era igual ou superior a 85%. Na segunda ronda, o questionário foi reenviado aos mesmos peritos, contendo apenas as categorias que não alcançaram o consenso na primeira ronda e as novas categorias identificadas pelos peritos na primeira ronda. Foi-lhes novamente solicitado a responderem se consideravam que a categoria CIF deveria ou não ser incluída na definição de MF. Cabe ressaltar que, para a validação das categorias da CIF da segunda ronda, foram seguidos os mesmos procedimentos descritos acima.

definition of FM. The experts were asked to indicate whether the ICF category was or was not included in the definition, as well as to suggest any other ICF category that, in their opinion, should be included.

After the first round of validation, 8 experts (as presented in Table 1) answered to the questionnaire, and a consensus was considered to include an ICF category in the study when agreement was equal to or greater than 85%. In the second round, the questionnaire was re-sent to the same experts, containing only the categories that did not reach consensus in the first round and the new categories identified by the experts in the first round. They were again asked to indicate whether the ICF category should or should not be included in the definition of FM. It is worth noting that the same procedures described above were followed to validate the ICF categories in the second round.

Tabela/Table 1: Caracterização dos peritos/Experts'characterization.

	Perito/ Expert 1	**Perito /Expert 2**	**Perito/ Expert 3**	**Perito/ Expert 4**	**Perito/ Expert 5**	**Perito/ Expert 6**	**Perito/ Expert 7**	**Perito/ Expert 8**
Idade, anos/Age, years	67	47	61	44	40	47	47	35
Habilitações académicas/Academic qualifications	M	D/PhD	D/PhD	M	M	D/PhD	D/PhD	D/PhD
Contexto de trabalho/ Work Context	Ensino/ Teaching	Ambos/Both	Ambos/Both	Ambos/Both	Ambos/Both	Ensino/Teaching	Ensino/ Teaching	Ambos/Both
Experiência com a CIF/ Experience with ICF	Sim/Yes	Sim/Yes	Sim/Yes	Sim/Yes	Sim/Yes	Sim/Yes	Sim/Yes	Sim/Yes
Experiência clínica em neurologia/ Clinical experience in neurology	Sim/Yes	Sim/Yes	Sim/Yes	Sim/Yes	Sim/Yes	Não/No	Sim/Yes	Sim/Yes
Anos de experiência com a CIF/Years of experience with ICF	> 10	> 10	> 10	> 10	5-10	> 10	> 10	5-10
Participação em grupos de investigação/ trabalho relacionados com a CIF/Participation in research/work groups related to the ICF	Sim/Yes	Sim/Yes	Não/No	Sim/Yes	Sim/Yes	Sim/Yes	Sim/Yes	Sim/Yes
Quantos participou, n/How many participated, n	2	6	0	5	1	10	6	1
Quantos Nacionais, n/ How many Nationals, n	2	5	0	3	1	10	4	1
Quantos Internacionais, n/How many International, n	0	1	0	2	0	0	2	0
Publicações relacionadas com a CIF/Publications related to the ICF	Não/No	Sim/Yes	Sim/Yes	Sim/Yes	Não/No	Sim/Yes	Sim/Yes	Sim/Yes
Quantas, n/ How many, n	0	9	1	2	0	4	3	1

Legenda/Legends: M – Mestrado/Master; D –Doutoramento/ PhD; Ambos/ ensino e prática clínica/Both - teaching and clinical practice; CIF – Classificação Internacional de Funcionalidade/ICF – International Classification of Functioning; n – número/n – number.

2.1.2. *SCOPING REVIEW* SOBRE OS IM DA MF

Para identificar os IM referenciados na literatura que avaliassem a MF nos utentes com sequelas de AVC, criou-se uma expressão de pesquisa *"stroke AND (outcome OR measure OR assessment OR evaluation OR scale OR test OR index OR questionnaire) AND "functional mobility"*. Esta foi submetida a 7 de Outubro de 2021 nas bases de dados online PubMed, EBSCO, CENTRAL, PEDro, *Web of Science*, *Science Direct* e *Wiley Online Library* e, de seguida, inseriram-se as referências no gestor de referências bibliográficas *Mendeley* (no dia 11/10/2021). Dos estudos obtidos, os duplicados foram eliminados, passando os restantes para uma fase de leitura individual dos títulos e resumos, por 5 revisores. A seleção dos estudos teve por base os seguintes critérios de inclusão: população com AVC e maior de idade; que o estudo fizesse referência a um IM em que os autores dissessem explicitamente que esse IM avaliava a MF; e idiomas - português, inglês, francês ou espanhol. Para as situações de "dúvida" e/ou discordância entre os 5 revisores, realizou-se uma reunião de consenso com 2 revisores independentes. Encontrados os textos integrais dos artigos selecionados na fase anterior, os 5 revisores procederam à leitura individual e seleção dos mesmos, segundo os critérios de inclusão. Seguidamente, realizou-se novamente uma reunião de consenso e procedeu-se à identificação do IM que referia avaliar a MF. Cada revisor extraiu individualmente e sistematizou esta informação em tabelas e, para a obtenção de consenso, procedeu-se a uma reunião com os revisores independentes.

2.1.3. CORRESPONDÊNCIA CIF COM OS IM

De seguida, procedeu-se à realização de uma tabela de correspondência entre cada um dos diferentes IM identificados na *Scoping Review* e as dimensões CIF identificadas pelos peritos. Depois de cada um dos 5 revisores ter feito individualmente a correspondência entre os IM e as categorias CIF determinadas anteriormente, obteve-se consenso entre os revisores e 2 revisores independentes.

2.2. QUAIS AS PROPRIEDADES PSICOMÉTRICAS DO IM DA MF COM MAIS CATEGORIAS CIF? (REVISÃO SISTEMÁTICA)

2.2.1. ESTRATÉGIA DE PESQUISA

Após identificado o IM com o maior número de correspondências CIF - RMI - procurou-se estudar as propriedades psicométricas do mesmo. Introduziu-se a 5 de Abril de 2022 a seguinte expressão de pesquisa nas bases de dados *online PubMed,* CENTRAL e EBSCO:*"stroke AND ("rivermead mobility index" OR RMI) AND ("measurement error" OR "internal consistency" OR psychometrics OR validity OR responsiveness OR reliability)"*.

2.2.2. SELEÇÃO DOS ESTUDOS

Dos estudos obtidos, os duplicados foram eliminados, passando os restantes para uma fase de leitura individual dos títulos e resumos por 5 revisores. A seleção dos estudos realizou-se segundo os critérios de inclusão: população de AVC; referência ao RMI; idiomas - português, inglês, francês ou espanhol; ser um estudo metodológico. Para as situações de "dúvida" e/ou discordância entre os revisores, realizou-se

2.1.2. SCOPING REVIEW ON FM OUTCOME MEASURES

To identify the MI referenced in the literature that assesses FM in patients with stroke sequelae, a search expression "stroke AND (outcome OR measure OR assessment OR evaluation OR scale OR test OR index OR questionnaire) AND "functional mobility" was created. This was submitted on October 7th, 2021 in the online databases PubMed, EBSCO, CENTRAL, PEDro, Web of Science, Science Direct and Wiley Online Library, and then the references were inserted into the bibliographic reference manager Mendeley (on October 11th, 2021). From the obtained studies, duplicates were eliminated, and the remaining ones were individually read by 5 reviewers based on their titles and abstracts. The selection of studies was based on the following inclusion criteria: population with stroke and over 18 years old; the study made reference to an MI in which the authors explicitly stated that this MI evaluated FM; and languages - Portuguese, English, French or Spanish. In cases of doubt and/or disagreement among the 5 reviewers, a consensus meeting was held with 2 independent reviewers. After the full-text articles of the selected studies in the previous phase were found, the 5 reviewers proceeded with individual reading and selection based on the inclusion criteria. Subsequently, a consensus meeting was held again, and the MI that referred to evaluating FM was identified. Each reviewer individually extracted and systematized this information into tables, and a meeting was held with the independent reviewers to obtain consensus.

2.1.3. CORRESPONDENCE BETWEEN ICF AND MI(S)

Next, a correspondence table was created between each of the different outcome measures identified in the Scoping Review and the ICF dimensions identified by the experts. After each of the 5 reviewers individually matched the outcome measures with the previously determined ICF categories, consensus was reached among the reviewers and 2 independent reviewers.

2.2. WHAT ARE THE PSYCHOMETRIC PROPERTIES OF THE FM MI WITH THE MOST ICF CATEGORIES? (SYSTEMATIC REVIEW)

2.2.1. SEARCH STRATEGY

After identifying the FM MI with the highest number of ICF correspondences - the Rivermead Mobility Index (RMI) - we aimed to study its psychometric properties. On April 5, 2022, we entered the following search terms into the online databases PubMed, CENTRAL, and EBSCO: "stroke AND ("rivermead mobility index" OR RMI) AND ("measurement error" OR "internal consistency" OR psychometrics OR validity OR responsiveness OR reliability)."

2.2.2. Study selection

Duplicates were eliminated from the studies obtained, and the remaining studies were subjected to individual title and abstract screening by 5 reviewers. Studies were selected according to the following inclusion criteria: stroke population, reference to the RMI, languages - Portuguese, English, French, or Spanish, and a methodological study design. In cases of doubt or disagreement among the reviewers, a consensus meeting was held with 2 independent reviewers. Once the full texts of the selected articles were identified, the 5 reviewers conducted individual readings and discriminated them according to the

uma reunião de consenso com 2 revisores independentes. Encontrados os textos integrais dos artigos selecionados, os 5 revisores procederam à leitura individual e discriminação dos mesmos, segundo os critérios de inclusão. Seguidamente, realizou-se novamente o consenso e determinou-se as categorias essenciais à extração de dados, nomeadamente as caraterísticas dos estudos (tamanho da amostra, sexo, idade, diagnóstico, lado da hemiparésia, período entre episodio e admissão, versão do RMI e respetivo idioma) e as propriedades psicométricas (fidedignidade, validade e sensibilidade).

2.2.3. EXTRAÇÃO DE DADOS

Cada revisor extraiu e sistematizou individualmente a informação em tabelas e, de seguida, procedeu-se a uma reunião com os revisores independentes para a obtenção de consenso.

2.2.4. AVALIAÇÃO DA QUALIDADE METODOLÓGICA

A avaliação da qualidade metodológica de cada estudo incluído fez-se através da grelha de avaliação "*COSMIN Risk of Bias checklist*" pelos 5 revisores, de forma a averiguar o risco de viés dos estudos incluídos. A COSMIN distingue 4 domínios, sendo estes a validade, a fidedignidade, a sensibilidade e a interpretabilidade (Prinsen et al., 2018).

Foram preenchidas as informações referentes às propriedades estudadas em cada estudo; a classificação foi feita através dos seguintes qualificadores de qualidade: muito boa, adequada, duvidosa ou inadequada; e a pontuação final foi dada pela classificação mais baixa de entre todos os itens de cada caixa/propriedade. Em caso de dúvida obteve-se consenso com os 2 revisores independentes.

2.2.5. AVALIAÇÃO DA QUALIDADE DAS PROPRIEDADES DE MEDIDA

A etapa seguinte consistiu na avaliação da qualidade das propriedades de medida investigadas pelos estudos, tendo-se aplicado, a cada resultado, os critérios de qualidade geral para as propriedades de medida, da "*COSMIN manual for systematic reviews of PROMs*", critérios estes atualizados e baseados nas propostas de Terwee et al. (2007) e Prinsen et al. (2016). Em termos da classificação da qualidade de cada propriedade, esta foi classificada como suficiente (+), insuficiente (-) ou indeterminada (?).

2.2.6. SÍNTESE DA EVIDÊNCIA

Numa última fase, foi realizada a síntese da evidência, de forma qualitativa, por propriedade psicométrica e por IM, incluindo a classificação segundo os critérios de qualidade das propriedades de medida e respetivo risco de viés.

O nível de evidência foi classificado em elevado/moderado/baixo/muito baixo, segundo uma adaptação da abordagem "*Grading of Recommendations Assessment, Development, and Evaluation* (GRADE)", retirada da "*COSMIN manual for systematic reviews of PROMs*", originalmente desenvolvida por GRADE (2013). Para a realização desta avaliação, foram tidos em linha de conta fatores como o risco de viés, inconsistência dos resultados, imprecisão relacionada com o tamanho da amostra e comparações indiretas, sendo a classificação final dada pela

inclusion criteria. Subsequently, consensus was again reached, and essential data extraction categories were determined, including study characteristics (sample size, sex, age, diagnosis, hemiparesis side, time between episode and admission, RMI version and respective language) and psychometric properties (reliability, validity, and sensitivity).

2.2.3. DATA EXTRACTION

Each reviewer individually extracted and organized the information in tables, followed by a meeting with the independent reviewers to reach a consensus.

2.2.4. ASSESSMENT OF METHODOLOGICAL QUALITY

The methodological quality of each included study was assessed using the COSMIN Risk of Bias checklist by the 5 reviewers to investigate the risk of bias of the included studies. COSMIN distinguishes 4 domains, namely validity, reliability, sensitivity, and interpretability (Prinsen et al., 2018).

The information regarding the studied properties in each study was filled out, and the classification was made using the following quality qualifiers: very good, adequate, doubtful, or inadequate. The final score was given by the lowest classification among all items of each box/property. In case of doubt, consensus was obtained with the 2 independent reviewers.

2.2.5. ASSESSMENT OF MEASUREMENT PROPERTIES QUALITY

The next step was to assess the quality of the investigated measurement properties by the studies, applying the general quality criteria for measurement properties from the "COSMIN manual for systematic reviews of PROMs" to each result. These criteria were updated and based on the proposals of Terwee et al. (2007) and Prinsen et al. (2016). Regarding the quality classification of each property, it was classified as sufficient (+), insufficient (-), or indeterminate (?).

2.2.6. EVIDENCE SYNTHESIS

In the last stage, a qualitative synthesis of the evidence was performed, by psychometric property and outcome measure, including classification according to the quality criteria of the measurement properties and their respective risk of bias.

The level of evidence was classified as high/moderate/low/very low, according to an adaptation of the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) approach, taken from the COSMIN manual for systematic reviews of Patient-Reported Outcome Measures (PROMs), originally developed by GRADE (2013). For this evaluation, factors such as risk of bias, inconsistency of results, imprecision related to sample size, and indirect comparisons were taken into account, with the final classification given by the downgrading of the level of evidence according to the severity of each factor (Mustafa et al., 2013).

Based on the quality of the properties, the consistency of the results for each psychometric property was also verified: consistent, when the quality was the same, or inconsistent if it was not, in different studies for each outcome measure. In case of inconsistent results, for the grading of the level of evidence of the property, only studies with positive quality values were analyzed.

descida de nível de acordo com a gravidade de cada fator (Mustafa et al., 2013).

Com base na qualidade das propriedades, verificou-se também a consistência dos resultados para cada propriedade psicométrica: consistente, quando a qualidade fosse a mesma, ou inconsistente caso não fosse, nos diferentes estudos para cada IM. No caso de os resultados serem inconsistentes, para a graduação do nível de evidência da propriedade, analisou-se a qualidade metodológica apenas dos estudos com valores de qualidade positivos.

3. RESULTADOS

3.1. QUAL O INSTRUMENTO(S) DE MEDIDA MAIS COMPLETO(S) PARA AVALIAR A MF EM CASOS DE AVC?

3.1.1. CATEGORIAS CIF E CONSULTA A PERITOS

Foi encontrada uma revisão da literatura que sistematizou a definição do conceito de MF (Bouça-Machado et al., 2020), na qual se identificou, a de Forhan and Gill (2013) e Bouça-Machado et al. (2018), como sendo a mais utilizada. Deste modo, a definição destes autores foi selecionada para a categorização CIF, que corresponde à definição apresentada na introdução - A MF define-se como a capacidade fisiológica de um indivíduo se mover de forma independente e segura em diversos ambientes, permitindo a execução de tarefas funcionais e, por conseguinte, a realização das AVD, em casa, no trabalho e na comunidade (Forhan and Gill, 2013). As três grandes áreas incluídas na MF são: mobilidade no leito, que se caracteriza como a capacidade de se mover na cama, incluindo ações como o rolar, desviar e movimentar de sentado para deitado, e vice-versa; transferências, que são descritas como a ação de se movimentar de uma superfície para outra, e que inclui transferir-se de uma cama para uma cadeira, ou de uma cadeira para outra; e deambulação, que é definida como a capacidade de andar, e inclui a assistência de terceiros, ou a assistência de dispositivos (Bouça-Machado et al., 2018).

Quanto ao questionário enviado aos peritos, para além das 29 categorias CIF, pré-selecionadas e que poderiam estar incluídas na definição de MF, foram propostas, pelos peritos, 19 categorias adicionais.

Para determinar a inclusão de cada categoria, foi determinado pelos autores, um nível de consenso entre os peritos, acima de 85%. Nesse sentido obteve-se um total de 16 categorias CIF abrangidas na definição de MF: "d4100 Deitar-se"; "d4103 Sentar-se"; "d4104 Pôr-se em pé"; "d4105 Curvar-se"; "d4106 Mudar o centro de gravidade do corpo"; "d4200 Auto transferir-se na posição de sentado"; "d4201 Auto transferir-se na posição de deitado"; "d4500 Andar distâncias curtas"; "d4501 Andar distâncias longas"; "d4502 Andar sobre superfícies diferentes"; "d4503 Andar contornando obstáculos"; "d4551 Subir/descer"; "d4600 Deslocar-se dentro de casa"; "d4601 Deslocar-se dentro de edifícios que não a própria casa"; "d4602 Deslocar-se fora da sua casa e de outros" e "d465 Deslocar-se utilizando algum tipo de equipamento". Na Tabela 1 está a caracterização dos peritos.

3.1.2. *SCOPING REVIEW* SOBRE OS IM DA MF

Através da estratégia de pesquisa implementada, foram identificados 1790 resultados, dos quais 198 na PubMed, 91 na

3. RESULTS

3.1. WHAT IS THE MOST COMPREHENSIVE MI(S) TO ASSESS FM IN CASES OF STROKE?

3.1.1. ICF CATEGORIES AND EXPERT CONSULTATION

A literature review that systematized the definition of FM was found (Bouça-Machado et al., 2020), in which the definition of Forhan and Gill (2013) and Bouça-Machado et al. (2018) were identified as the most commonly used. Therefore, the definition of these authors was selected for the ICF categorization, which corresponds to the definition presented in the introduction - FM is defined as the physiological ability of an individual to move independently and safely in different environments, allowing the execution of functional tasks and, consequently, the performance of ADLs, at home, work, and in the community (Forhan and Gill, 2013). The three main areas included in FM are: bed mobility, which is characterized as the ability to move in bed, including actions such as rolling, shifting, and moving from sitting to lying down, and vice versa; transfers, which are described as the action of moving from one surface to another, and includes transferring from a bed to a chair or from one chair to another; and ambulation, which is defined as the ability to walk and includes the assistance of others or the assistance of devices (Bouça-Machado et al., 2018).

As for the questionnaire sent to the experts, in addition to the 29 pre-selected ICF categories that could be included in the definition of FM, 19 additional categories were proposed by the experts.

To determine the inclusion of each category, a level of consensus above 85% among the experts was determined by the authors. In this sense, a total of 16 ICF categories were covered in the definition of FM: "d4100 Lying down"; "d4103 Sitting"; "d4104 Standing up"; "d4105 Bending"; "d4106 Changing the centre of gravity of the body"; "d4200 Self-transfer in sitting position"; "d4201 Self-transfer in lying position"; "d4500 Walking short distances"; "d4501 Walking long distances"; "d4502 Walking on different surfaces"; "d4503 Walking around obstacles"; "d4551 Climbing/downstairs"; "d4600 Moving around inside the house"; "d4601 Moving around inside buildings other than one's own home"; "d4602 Moving around outside one's own home and others" and "d465 Moving around using some kind of equipment".

3.1.2. SCOPING REVIEW ON FM MI(S)

Through the implemented search strategy, 1790 results were identified, of which 198 were in PubMed, 91 in EBSCO, 169 in CENTRAL, 42 in PEDro, 318 in Web of Science, 910 in Science Direct, and 62 in Wiley Online Library. Of these, 397 duplicates were eliminated, reducing the number to 1393 studies. By reading the titles and abstracts, it was found that 1181 did not meet the inclusion criteria, leaving 212 studies. Full texts were obtained, duplicates were removed, and inclusion criteria were applied. Therefore, 120 studies that met the inclusion criteria were included (Abdullahi et al., 2021a; Abdullahi et al., 2021b; Au-Yeung et al., 2002; Barcala et al., 2013; Barclay et al., 2016; Belgen et al., 2006; Boissoneault et al., 2020; Bonini-Rocha et al., 2018; Brunelli et al., 2019; Bunketorp-Käll et al., 2019; Burns et al., 2021; Busse and Tyson, 2009; Buvarp et al., 2020; Casalechi et al., 2020; Chan et al., 2017; Chau et al., 2021; Cheok et al., 2015; Christopher et al., 2021; Chung et al., 2014; Clayton et al., 2021; Cooke et al.,

EBSCO, 169 na CENTRAL, 42 na PEDro, 318 na *Web of Science*, 910 na *Science Direct* e 62 na *Wiley Online Library*. Destes, foram eliminados 397 duplicados, reduzindo-se para 1393 estudos. Com a leitura dos títulos e resumos, verificou-se que 1181 não cumpriam os critérios de inclusão, restando 212 estudos. Obtiveram-se os textos integrais, os quais foram lidos, eliminados os duplicados e aplicados os critérios de inclusão. Deste modo, foram incluídos 120 estudos que cumpriam os critérios de inclusão (Abdullahi et al., 2021a; Abdullahi et al., 2021b; Au-Yeung et al., 2002; Barcala et al., 2013; Barclay et al., 2016; Belgen et al., 2006; Boissoneault et al., 2020; Bonini-Rocha et al., 2018; Brunelli et al., 2019; Bunketorp-Käll et al., 2019; Burns et al., 2021; Busse and Tyson, 2009; Buvarp et al., 2020; Casalechi et al., 2020; Chan et al., 2017; Chau et al., 2021; Cheok et al., 2015; Christopher et al., 2021; Chung et al., 2014; Clayton et al., 2021; Cooke et al., 2010; Correia et al., 2017; Costantino et al., 2018; Cugusi et al., 2017; da Cunha et al., 2017; da Cunha et al., 2021; de Oliveira Carletti et al., 2017; de Paula et al., 2019; de Rooij et al., 2021a; de Rooij et al., 2021b; de Rooij et al., 2019; DeMeyer et al., 2015; Di Tella et al., 2021; Dumont et al., 2017; Eckhardt et al., 2011; Eichinger et al., 2018; English et al., 2017; Faria et al., 2012; Farmani et al., 2016; Fortes et al., 2020; Francisco and Boake, 2003; French et al., 2018; Garland et al., 2003; Ghasemi et al., 2018; Goh et al., 2013; Guan et al., 2015; Gunal et al., 2019; Guzik et al., 2019; Hafsteinsdóttir et al., 2014; Hakakzadeh et al., 2019; Holt et al., 2021; Horton and Irwin, 2018; Huțanu et al., 2020; Jackson et al., 2010; Jones et al., 2016; Kendrick et al., 2001; Kim et al., 2015; Knorr et al., 2010; Ko et al., 2014; Kuberan et al., 2017; Kudlac et al., 2019; Kumar et al., 2013; Li et al., 2017; Macko et al., 2005; Marigold et al., 2005; Mousa et al., 2016; Ng et al., 2009; Ng et al., 2016; Noveletto et al., 2020; Nuñez Filha et al., 2020; Pardo et al., 2020; Pardo et al., 2015; Park et al., 2016; Park and Kim, 2016) (Park et al., 2017; Park and Cho, 2021; Patil and Rao, 2011; Patterson et al., 2015; Pires et al., 2021; Prout et al., 2015; Rajaratnam et al., 2013; Ribeiro et al., 2018; Rochetti et al., 2021; Ruescas-Nicolau et al., 2021; Salbach et al., 2006; Salbach et al., 2005; Salter et al., 2005; Salter et al., 2010; Santos et al., 2011a; Santos et al., 2011b; Sarwar et al., 2019; Shears et al., 2017; Sheffler and Chae, 2013; Sheffler et al., 2012; Silva and Israel, 2019; Silva et al., 2020a; Skidmore et al., 2008; Stein et al., 2009; Taghizadeh et al., 2013; Tripp et al., 2014; Tyson et al., 2017; Tyson and Rogerson, 2009; Vinicius-Soares et al., 2020; Wright et al., 2017; Yadav et al., 2020; Yan et al., 2009; Yang and Butler, 2020). Na figura 1 está representado o fluxograma da pesquisa.

Na tabela 2 está o número de vezes que cada um dos IM foi mencionado nos artigos incluídos. O IM mais vezes mencionado foi o TUG com 78 menções.

3.1.3. CORRESPONDÊNCIA CIF COM OS IM

Após a *Scoping Review,* de todos os instrumentos referidos, excluiu-se as aplicações móveis, uma vez que estas não se demonstraram acessíveis para uma avaliação em prática clínica regular, dado serem aplicações experimentais ainda em fase de desenvolvimento.

Feita a correspondência das categorias CIF com os IM, verificou-se que o RMI obteve um maior número de correspondências com 13/16 o que equivale a uma percentagem de 81.25%. Seguiu-se a CMSA com um total de 11/16 (68.5%), a

2010; Correia et al., 2017; Costantino et al., 2018; Cugusi et al., 2017; da Cunha et al., 2017; da Cunha et al., 2021; de Oliveira Carletti et al., 2017; de Paula et al., 2019; de Rooij et al., 2021a; de Rooij et al., 2021b; de Rooij et al., 2019; DeMeyer et al., 2015; Di Tella et al., 2021; Dumont et al., 2017; Eckhardt et al., 2011; Eichinger et al., 2018; English et al., 2017; Faria et al., 2012; Farmani et al., 2016; Fortes et al., 2020; Francisco and Boake, 2003; French et al., 2018; Garland et al., 2003; Ghasemi et al., 2018; Goh et al., 2013; Guan et al., 2015; Gunal et al., 2019; Guzik et al., 2019; Hafsteinsdóttir et al., 2014; Hakakzadeh et al., 2019; Holt et al., 2021; Horton and Irwin, 2018; Huțanu et al., 2020; Jackson et al., 2010; Jones et al., 2016; Kendrick et al., 2001; Kim et al., 2015; Knorr et al., 2010; Ko et al., 2014; Kuberan et al., 2017; Kudlac et al., 2019; Kumar et al., 2013; Li et al., 2017; Macko et al., 2005; Marigold et al., 2005; Mousa et al., 2016; Ng et al., 2009; Ng et al., 2016; Noveletto et al., 2020; Nuñez Filha et al., 2020; Pardo et al., 2020; Pardo et al., 2015; Park et al., 2016; Park and Kim, 2016; Park et al., 2017; Park and Cho, 2021; Patil and Rao, 2011; Patterson et al., 2015; Pires et al., 2021; Prout et al., 2015; Rajaratnam et al., 2013; Ribeiro et al., 2018; Rochetti et al., 2021; Ruescas-Nicolau et al., 2021; Salbach et al., 2006; Salbach et al., 2005; Salter et al., 2005; Salter et al., 2010; Santos et al., 2011a; Santos et al., 2011b; Sarwar et al., 2019; Shears et al., 2017; Sheffler and Chae, 2013; Sheffler et al., 2012; Silva and Israel, 2019; Silva et al., 2020a; Skidmore et al., 2008; Stein et al., 2009; Taghizadeh et al., 2013; Tripp et al., 2014; Tyson et al., 2017; Tyson and Rogerson, 2009; Vinicius-Soares et al., 2020; Wright et al., 2017; Yadav et al., 2020; Yan et al., 2009; Yang and Butler, 2020). Figure 1 shows the research flowchart.

Table 2 presents the number of times each of the MIs was mentioned in the included articles. The most frequently mentioned MI was TUG, with 78 citations.

3.1.3. ICF CORRESPONDENCE WITH MI(S)

After the Scoping Review, all mobile applications were excluded as they were not accessible for regular clinical practice evaluation, given that they were still experimental applications in development.

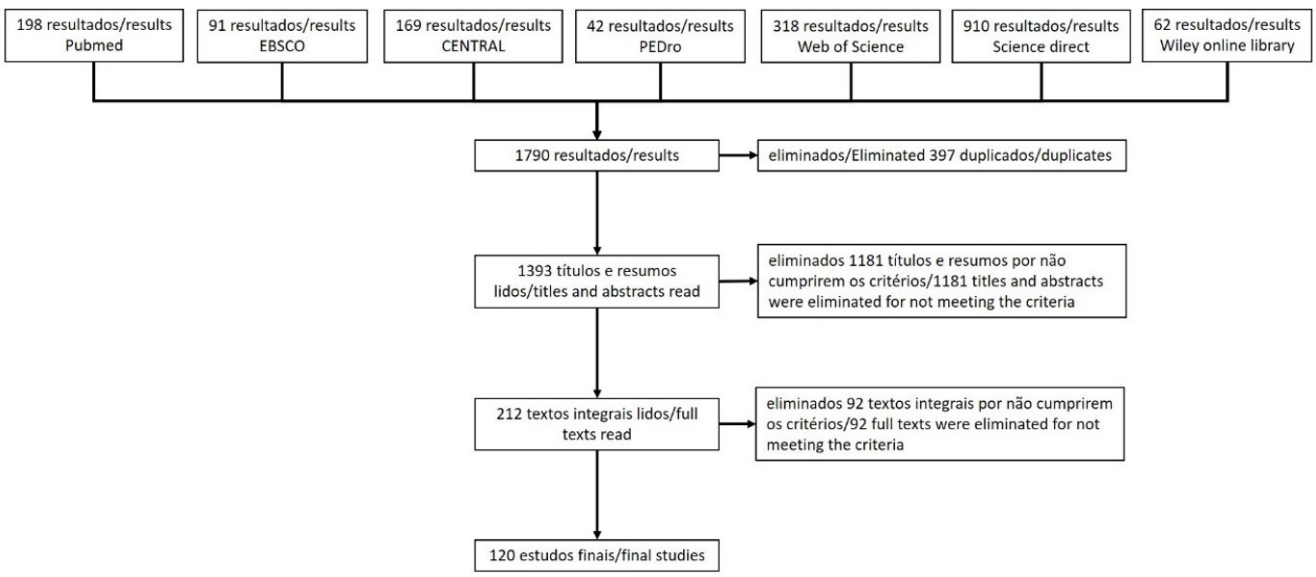
After matching the ICF categories with the MIs, it was found that RMI obtained the highest number of correspondences with 13/16, which is equivalent to a percentage of 81.25%. CMSA followed with a total of 11/16 (68.5%), PFMP and FAC with 10/16 (62.5%), and mRMI with 9/10 (56.25%). With half of the correspondences, COVS was identified (8/16), and below 50%, the following: mMAS, FIM, 6-clicks, mEFAP, and DEMMI with 7/16 (43.75%); TUG, FAM, BBS, DGI, GUG, WIQ, EMS, TUGm, TUGc, FGA, SIS with 6/16 (37.5%); BI, TUG-ABS, PASS, PAScS, 6MWT, 2MWT, 5TSTS, WGS, GST with 3/16 (18.75%); and QMS, 10MWT, SSWS, FRT with 2/16 (12.5%). Lastly, MSL was found with only one correspondence (6.25%), and WMFS and AZ were not found to correspond with any categories.

3.2. WHAT ARE THE PSYCHOMETRIC PROPERTIES OF THE FM MI WITH THE MOST ICF CATEGORIES? (SYSTEMATIC REVIEW)

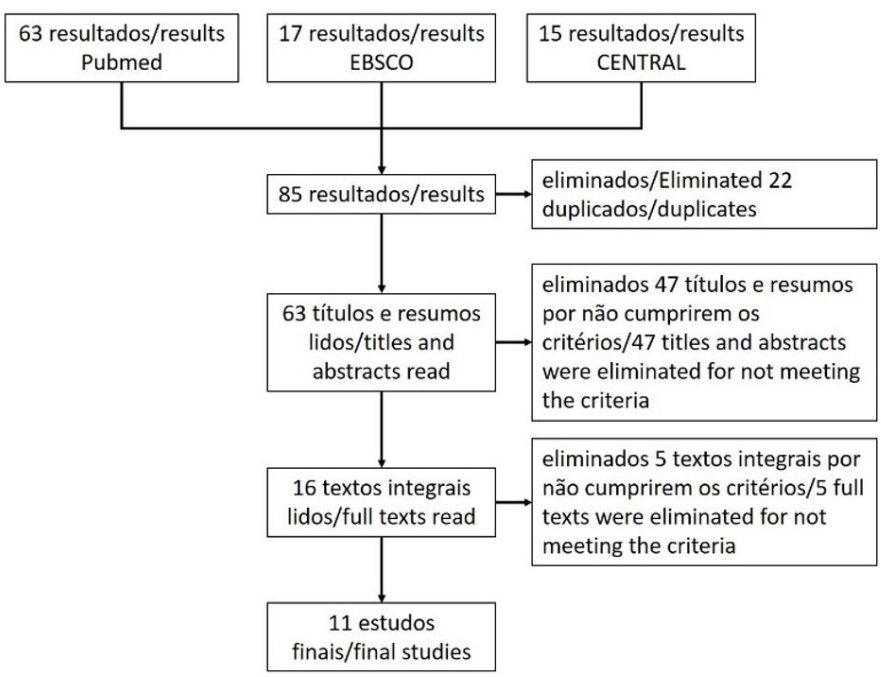
Considering that the RMI was the MI with the highest number of ICF correspondences, the search expression yielded 85 results, of which 63 were in PubMed, 17 in EBSCO, and 15 in CENTRAL. Of these, 22 duplicates were eliminated, reducing the

PFMP e a FAC com 10/16 (62.5%) e o mRMI com 9/10 (56.25%). Com metade das correspondências, identificou-se a COVS (8/16) e abaixo dos 50% as seguintes: a mMAS, a FIM, o 6-*clicks*, a mEFAP e a DEMMI com 7/16 (43.75%); a TUG, FAM, BBS, DGI, GUG, WIQ, EMS, TUGm, TUGc, FGA, SIS com 6/16 (37.5%); a BI, TUG-ABS, PASS, PAScS, 6MWT, 2MWT, 5TSTS, WGS, GST com 3/16 (18.75%); e a QMS, 10MWT, SSWS, FRT com 2/16 (12.5%). Por último, apenas com uma correspondência, constatou-se a MSL (6.25%) e com nenhuma os instrumentos WMFS e AZ.

number of studies to 63. After reading the titles and abstracts, it was found that 47 did not meet the inclusion criteria, leaving 16 studies. After reading the full texts, 11 studies that met the inclusion criteria were included (Antonucci et al., 2002; Chen et al., 2007; Franchignoni et al., 2003; Green and Young, 2001; Hsieh et al., 2000; Hsueh et al., 2003; Lennon and Johnson, 2000; Pavan et al., 2010; Rådman et al., 2015; Roorda et al., 2008; Schindl et al., 2000). Figure 2 shows the study selection flowchart.



Figura/Figure 1: Fluxograma da seleção dos estudos da *Scoping Review*/Flowchart for Selection of Studies - Scoping Review.



Figura/Figure 2: Fluxograma da seleção dos estudos da Revisão Sistemática/Flowchart for Selection of Studies - Systematic Review.

Tabela/Table 2: Número de vez que cada Instrumento de Medida foi mencionado nos estudos incluídos/Number of times each measurement instrument was mentioned in the included studies.

Instrumento de medida/ Measurement Instrument	Número de vezes mencionado/ Number of time mentioned
TUG	78
RMI	13
10MWT	7
BBS	6
FIM	5
COVS	4
FAC	3
mRMI; 2MWT; BI; DGI; MEFAP	2
QMS, CMSA; mMAS; aplicações moveis/mobile applications FAM; SSWS; PFMP; 6-clicks; WMFS; GUG; WIQ; DEMMI; 5TSTS; MSL; AZ; WGS; TUG-ABS; FRT; PAScS; PASS; EMS; TUGm; TUGc; FGA; SIS; GST	1

Legenda/Legends: Rivermead Mobility Index (RMI); Timed Up and Go test (TUG); Qualisys Motion System (QMS); Chedoke-McMaster Stroke Assessment (CMSA); Six Minute Walk Test (6MWT); Modified Motor Assessment Scale (mMAS); aplicações móveis/mobile applications (9zest Stroke App, STARFISH, Fitlab Training, Fitlab Test, FARMALARM, CARE4STROKE, Google Fit, Health, STEPZ, Pacer, Fitbit Ultra, SmartAftercare); Ten Meter Walk Test (10MWT); Functional Ambulation Categories (FAC); Functional Independence Measure (FIM); Two Minute Walk test (2MWT); Timed Up and Go Assessment of Biomechanical Strategies (TUG-ABS); Timed Up and Go Manual (TUGm); Timed Up and Go Manual Cognitive (TUGc); Functional Assessment Measure (FAM); Self-selected walking speed (SSWS); Clinical Outcome Variables Scale (COVS); Berg Balance Scale (BBS); Five Times Sit to Stand (5TSTS); Physiotherapy Functional Mobility Profile (PFMP); 6-clicks; Barthel Index (BI); Dynamic Gait Index (DGI); Wolf Motor Functional Scale (WMFS); Walking Impairment Questionnaire (WIQ); Modified Emory Functional Ambulation Profile (mEFAP); Modified Rivermead Mobility Index (mRMI); Get up and Go time (GUG); The de Morton Mobility Index (DEMMI); Maximal Step Length (MSL); Ambulatory Zone (AZ); Winsconsin Gait Scale (WGS); Performance Assessment of Self-care Skills (PAScS); Postural Assessment Scale for Stroke (PASS); Functional Gait Assessment (FGA); Stroke Impact Scale (SIS); Gait Speed Test (GST); The Erderly Mobility Scale (EMS); Functional Reach Test (FRT).

3.2. QUAIS AS PROPRIEDADES PSICOMÉTRICAS DO IM DA MF COM MAIS CATEGORIAS CIF? (REVISÃO SISTEMÁTICA)

Tendo em conta que o RMI foi o IM com maior número de correspondências CIF, com a expressão de pesquisa submetida obtiveram-se 85 resultados, dos quais 63 na PubMed, 17 na EBSCO e 15 na CENTRAL. Destes, foram eliminados 22 duplicados, reduzindo-se para 63 estudos. Com a leitura dos títulos e resumos, verificou-se que 47 não cumpriam os critérios de inclusão, restando 16 estudos. Após a leitura dos textos integrais dos mesmos foram incluídos 11 estudos que cumpriam os critérios de inclusão (Antonucci et al., 2002; Chen et al., 2007; Franchignoni et al., 2003; Green and Young, 2001; Hsieh et al., 2000; Hsueh et al., 2003; Lennon and Johnson, 2000; Pavan et al., 2010; Rådman et al., 2015; Roorda et al., 2008; Schindl et al., 2000). Na imagem 2 está o fluxograma da seleção dos estudos.

3.2.1. O QUE É O RMI?

O RMI é um IM utilizado na reabilitação neurológica que avalia a MF em utentes com sequelas de AVC. Este IM teve origem no *Rivermead Motor Assessment Gross Function Scale*, sendo desenhado e validado por Collen et al. (1991) com o propósito de ser uma medida rápida e de fácil aplicação em utentes com sequelas de AVC ou lesão neurológica. O RMI tem um tempo de administração de 3 a 4 minutos e compreende 15 itens, dos quais 14 questões e 1 item de observação direta. O IM engloba uma diversidade de atividades, desde a mobilidade no leito à corrida, que progridem na sua dificuldade, sendo pontuados de 0 ou 1 dependendo da capacidade do utente completar a tarefa específica instruída. Os itens recebem uma pontuação de 0 se a resposta for "não" e 1 se "sim", pelo que o *score* total corresponde à soma de todos os pontos, sendo o valor máximo atingível equivalente a 15. Deste modo, quanto mais alta o *score* obtido, maior o preditivo de MF (Collen et al., 1991).

3.2.1. WHAT IS THE RMI?

The RMI is an MI used in neurological rehabilitation to assess motor function in patients with stroke sequelae. This MI originated from the Rivermead Motor Assessment Gross Function Scale, and was designed and validated by Collen et al. (1991) with the purpose of being a quick and easy-to-administer measure for patients with stroke or neurological injury. The RMI has an administration time of 3 to 4 minutes and comprises 15 items, including 14 questions and 1 item of direct observation. The MI encompasses a variety of activities, from bed mobility to running, which progress in difficulty and are scored as 0 or 1 depending on the patient's ability to complete the instructed specific task. Items are scored as 0 if the response is "no" and 1 if "yes", so the total score corresponds to the sum of all points, with the maximum achievable value being 15. Thus, the higher the score obtained, the greater the predictive value of motor function (Collen et al., 1991).

A modified version of the RMI was also developed - the Modified Rivermead Mobility Index (mRMI) - which comprises a new scoring system, ranging from a scale of 2 to 6 points in each item. This version is more concise, containing seven fewer items than the original, with the objective of measuring only the essential parameters related to mobility, considered by physiotherapists in the evaluation of treatment effects on patients after stroke (Lennon and Johnson, 2000). Although the mRMI only obtained a correspondence of 56.25% (9/10) in the ICF correspondence, being only the fourth with the highest correspondence, it was included in the review, as there may be studies in which both versions were applied.

3.2.2. SUMMARY OF GENERAL CHARACTERISTICS OF THE STUDIES

Some of the main characteristics of the included studies were analyzed (Table 3). Studies published between 2000 and

Foi também desenvolvida a versão modificada do RMI - *Modified Rivermead Mobility Index* (mRMI) - que compreende uma nova forma de pontuação, passando de uma escala de 2 para 6 pontos em cada item. Esta é mais reduzida, contendo menos 7 itens que a original, com o objetivo de medir apenas os parâmetros essenciais relacionados com a mobilidade, considerados pelos fisioterapeutas, na avaliação dos efeitos de tratamento dos utentes após AVC (Lennon and Johnson, 2000). Apesar de, na correspondência da CIF, o mRMI só ter obtido uma correspondência de 56.25% (9/10), sendo apenas o quarto com maior correspondência, optou-se por introduzi-lo na revisão, uma vez que poderiam existir estudos em que se aplicassem os dois.

3.2.2. RESUMO DAS CARACTERÍSTICAS GERAIS DOS ESTUDOS

Dos estudos incluídos, foram analisadas algumas das principais características (Tabela 3), tendo sido identificados estudos publicados entre os anos 2000 e 2015, um número de participantes entre 22 e 620, com uma média de idades equivalente a 54 anos. No que concerne ao diagnóstico, verificou-se uma maior prevalência de AVC isquémico, com hemiparésia do lado esquerdo. O período mínimo de admissão foi 1 dia, tendo atingido um máximo de 55.5 meses. Dos estudos encontrados, foram utilizados 7 idiomas distintos, mais especificamente para a versão original - italiano (2), chinês (3), inglês (1), português do brasil (1), holandês (1), alemão (1) - e para a versão modificada - inglês (1), sueco (1) e chinês (1). Por fim, as propriedades psicométricas estudadas passaram pela validade [validade de constructo (convergente e estrutural), validade de conteúdo e validade de critério (concorrente e preditiva)], fidedignidade (consistência interna, fidedignidade inter e intra-observador e erro padrão de medida) e sensibilidade (sensibilidade à mudança e efeito teto e chão) (Tabela 4).

2015 were identified, with a number of participants ranging from 22 to 620, with an average age of 54 years. Regarding the diagnosis, a higher prevalence of ischemic stroke with left-sided hemiparesis was observed. The minimum admission period was 1 day, with a maximum of 55.5 months. Seven different languages were used in the studies found, specifically for the original version - Italian (2), Chinese (3), English (1), Brazilian Portuguese (1), Dutch (1), German (1) - and for the modified version - English (1), Swedish (1) and Chinese (1). Finally, the psychometric properties studied included validity [construct validity (convergent and structural), content validity and criterion validity (concurrent and predictive)], reliability (internal consistency, inter- and intra-observer reliability, and standard error of measurement), and sensitivity (sensitivity to change and ceiling and floor effects) (Table 4).

3.2.3. SUMMARY OF PSYCHOMETRIC PROPERTIES RESULTS

Convergent validity

The convergent construct validity of the RMI was assessed in four studies (Franchignoni et al., 2003; Hsieh et al., 2000; Hsueh et al., 2003; Schindl et al., 2000), where adequate to excellent correlations with other MI were demonstrated.

In Franchignoni et al.'s (2003) study, conducted with 73 stroke patients in a rehabilitation unit, RMI scores, both at admission and after 5 weeks, were correlated with scores from the motor and cognitive subscales of the FIM, the 'leg' section of the Motricity Index (MI-leg), and the Trunk Control Test (TCT). These correlations were statistically significant ($r > 0.49$, $p < 0.0001$), particularly between the RMI and FIM motor ($rs = 0.69$, $p < 0.0001$), and to a lesser extent, between the RMI and MI-leg ($rs = 0.36$, $p = 0.002$) and the TCT ($rs = 0.26$, $p = 0.03$). However, no significant data were found for the cognitive subscale of the FIM.

Tabela/Table 3: Características dos estudos incluídos na revisão sistemática/Characteristics of the studies included in the systematic review.

Estudo/ Study	Tamanho da Amostra/ Sample size, n	Sexo/Gender, n (%)		Idade, anos/Age, years		Diagnóstico/ Diagnosis, n (%)		Lado da hemiparésia/ Side of hemiparesis, n (%)			Período entre episódio e admissão/ Period between the episode and admission	
		Masculino/ Male	Feminino/ Female	Média (DP)/ Average (SD)	Intervalo/ Interval	Hemorrágico/ Hemorrhagic	Isquémico/ Ischemic	Direito/ Right	Esquerdo/ Left	Bilateral/ Bilateral	Médoa (DP)/ Average (SD)	Intervalo/ Interval
Antonucci et al. (2002)	308	153 (49.7)	155 (50.3)	62.79 (11.94)	14-79			168 (55)	140 (45)	0	52.48 dias/days (36.22)	
Chen et al. (2007)	50	32 (64)	18 (36)	60.9 (12.8)		20 (40)	30 (60)	24 (48)	24 (48)	2 (4)	24 meses/ months	13.8-55.5 meses/ months
Franchignoni et al. (2003)	73	40 (55)	33 (45)	67.0 (20.2)	47-91	21 (29)	52 (71)	38 (52)	35 (48)	0	35 dias/ days	17-50 dias/ days
Green et al. (2003)	22	16 (73)	6 (27)	71.6 (6.8)				17 (77)	5 (23)	0	15 meses/ months (0.5)	
Hsieh et al. (2000)	38	22 (58)	16 (42)	62.1 (9.8)		14 (37)	19 (50)	12 (32)	26 (68)	0	24 dias/ days	7-53 dias/ days
Hsueh et al. (2003)	57	34 (60)	23 (40)	64.2 (11.5)		18 (32)	39 (68)	29 (51)	28 (50)	0	14 dias/ days	
Lennon & Johnson (2000)	30			74.25 (18.25)				17 (57)	13 (43)	0		
Pavan et al. (2010)	95	56 (59)	39 (41)	61 (12.3)	30-88			47 (50)	44 (46.8)	0		

Rådman et al. (2015)	37	19 (51)	18 (49)	76	55-94	4 (11)	33 (92)	16 (43)	21 (57)	0		1-14 dias/ days
Roorda et al. (2008)	620	Hol/Dutch: 102 (51) Ing/Engl: 195 (46)	Hol: 98 (49) Ing: 225 (54)	Hol/ Dutch: 58.6 (11.8) Ing/Engl: 74.3 (9.2)				DP/SD: 66 EP: 203	DPI: 91 EP: 213	0	DP/SD: ??? Ing/EP: 3 semanas/ weeks	
Schindl et al. (2000)	197	106 (54)	91 (46)	A: 72 B: 70	A: 66-79 B: 61-77	19 (10)	178 (90)	114 (58)	83 (42)	0	A: 3 dias/ days B: 88 dias/ days	A: 1-7 dias/ days B: 19-784 dias/days

Legenda/Legends: n – – número/number; DP- Desvio Padrão/SD – standard deviation; Hol-amostra de Holandeses/DP – sample of Dutch people; Ing- amostra de Ingleses/EP – sample of English people; A – amostra do Centro A/sample from center A; B – amostra do Centro B/sample from center B.

Tabela/Table 4: Propriedades psicométricas estudadas/Studied Psychometric Properties

Estudo/Study	Idioma do RMI/versão/ Version language of RMI	Propriedades psicométricas estudadas e análises efetuadas/Psychometric Properties studied and analyzes carried out.
Antonucci et al. (2002)	Italiano/Italian/RMI	Validade estrutural/Structural validity (Rasch Analysis).
Chen et al. (2007)	Chinês/Chinese/RMI	Fidedignidade intra-observador (coeficiente de correlação interclasse)/Intra-rater reliability (interclass correlation coefficient); Erro padrão de medida/Standard measurement error; Diferença mínima detetável/Minimum detectable difference.
Franchignoni et al. (2003)	Italiano/Italian/RMI	Consistência interna (alfa de Cronbach e coeficiente de correlação item-total/Internal consistency (Cronbach's alfa and item-total correlation coefficient); Validade estrutural (coeficiente de reprodutibilidade e coeficiente de escalabilidade)/Structural validity (reproducibility coefficient and scalability coefficient); Validade convergente (coeficiente de correlação de Spearman entre a RMI e a motorFIM, cognFIM, MI-leg e TCT)/ Convergent validity (Spearman correlation coefficient) between RMI and motorFIM, cognFIM, MI-leg e TCT); Sensibilidade à mudança (teste dos sinais, teste de Wilcoxon e magnitude do efeito)/Responsivness to change (signs test, Wilcoxon test and effect size).
Green et al. (2003)	Inglês/English/RMI	Fidedignidade teste-reteste (coeficiente de fidedignidade e diferença média)/Reliability and test retest (reliability coefficient and mean difference) Fidedignidade inter-observador - % de concordância entre itens (Wilcoxon e índice Kappa) e total (Bland and Altman)/Reliability inter-rater - % of agreement between items (Wilcoxon and Kappa index) and total (Bland and Altman).
Hsieh et al. (2000)	ChinêsChinese/RMI	Validade estrutural (coeficiente de reprodutibilidade e coeficiente de escalabilidade)/Structural validity (reproducibility coefficient and scalability coefficient); Validade concorrente (coeficiente de correlação de Spearman entre a RMI e o BI)/Concurrent validity (Spearman correlation coefficient between RMI and BI); Validade convergente (coeficiente de correlação de Spearman entre a RMI e BBS)/Convergent validity (Spearman correlation coefficient between RMI and BBS); Validade preditiva (coeficiente de correlação de Spearman entre a avaliação inicial e avaliação na alta)/Predictive validity (Spearman correlation coefficient between baseline assessment and discharge assessment); Sensibilidade à mudança (coeficiente de correlação de Spearman das mudanças da RMI com mudanças no BI; % de indivíduos que melhorou mais de 3 pontos)/Responsivness to change (Spearman correlation coefficient of RMI changes with BI changes; % of subjects who improved more than 3 points).
Hsueh et al. (2003)	Chinês/Chinese/RMI e mRMI	Fidedignidade inter-observador (coeficiente de correlação interclasse)/Inter-rater reliability (interclass correlation coefficient); Validade concorrente (coeficiente de correlação de Spearman com o BI)/Concurrent validity (Spearman correlation coefficient with BI); Validade preditiva (coeficiente de correlação de Spearman em 3 datas, com a BI aos 180 dias)/Predictive validity (Spearman correlation coefficient at 3 dates, with BI at 180 days); Validade convergente (coeficiente de correlação de Spearman e coeficiente de correlação inter-classe com a STREAM e a mRMI)/Convergent validity (Spearman correlation coefficient and interclass correlation coefficient with STREAM and mRMI); Sensibilidade (média da resposta padronizada)/Responsivness (mean of standardized response).
Lennon & Johnson (2000)	English/mRMI	Validade de conteúdo/facial (nível de concordância entre fisioterapeutas)/Content/face validity (level of agreement between physiotherapists); Fidedignidade inter-observador (coeficiente de correlação interclasse)/Intra-rater reliability (interclass correlation coefficient); Fidedignidade intra-observador (Teste-T emparelhado) /Intra-rater reliability (Paired T-Test); Consistência interna (alfa de Cronbach)/Internal consistency (Cronbach's alfa).
Pavan et al. (2010)	Português do Brasil/ Brazilian Portuguese/RMI	Consistência interna (alfa de Cronbach)/Internal consistency (Cronbach's alfa); Fidedignidade intra-observador (teste de Wilcoxon assinado)/Intra-rater reliability (signed Wilcoxon test).
Rådman et al. (2015)	Sueco/Swedish/mRMI	Fidedignidade teste-reteste (estatítica Kappa ponderada e coeficiente de correlação interclasse)/Reliability and test-retest (weighted Kappa statistics and interclass correlation coefficient); Fidedignidade inter-observador (estatítica Kappa ponderada)/Inter-rater reliability (weighted Kappa statistics); Consistência interna (alfa de Cronbach e coeficiente de correlação interclasse)/Internal consistency (Cronbach's alfa and interclass correlation coefficient).
Roorda et al. (2008)	Holandês/Dutch/RMI	Consistência Interna (alfa de Cronbach)/Internal consistency (Cronbach's alfa); Validade estrutural (Mokken scale analysis - item response theory e coeficiente de escalabilidade)/Structural validity (Mokken scale analysis - item response theory and scalability coefficient); Validade de Constructo (coeficiente de correlação de Spearman entre a RMI e o BI)/Construct validity (Spearman correlation coeficiente between RMI and BI).

Schindl et al. (2000)	Alemão/German/RMI	Fidedignidade teste-reteste (coeficiente de correlação de Spearman e % de diferença entre avaliações)/Reliability test-retest (Spearman correlation coefficient and % difference between assessments); Validade convergente (coeficiente de correlação de Spearman entre RMI e 10MWT e motorFIM)/Convergent validity (Spearman correlation coefficient between RMI and 10MWT and motorFIM); Sensibilidade (coeficiente de correlação de Spearman entre RMI e 10MWT e motorFIM)/Responsivness (Spearman correlation coefficient between RMI and 10MWT and motorFIM).
Legenda/Legends: Rivermead Mobility Index (RMI); Functional Independence Measure (FIM); leg section of Motricity Index (MI-leg); Trunk Control Test (TCT); Barthel Index (BI); Berg Balance Scale (BBS); Stroke Rehabilitation Assessment of Movement (STREAM).		

3.2.3. RESUMO DOS RESULTADOS DAS PROPRIEDADES PSICOMÉTRICAS

Validade convergente

A validade de construto convergente do RMI foi avaliada em quatro estudos (Franchignoni et al., 2003; Hsieh et al., 2000; Hsueh et al., 2003; Schindl et al., 2000), onde foram demonstradas correlações adequadas a excelentes com outros IM.

No estudo de Franchignoni et al. (2003) conduzido a 73 utentes de AVC em unidade de reabilitação, os scores do RMI, tanto no momento da admissão como após 5 semanas, foram correlacionadas com pontuações das subescalas motora e cognitiva da FIM, da *The 'leg' section of the Motricity Index* (MI-leg) e da *The Trunk Control Test* (TCT). Estas demonstraram ser estatisticamente significativas ($r > 0.49$, $p < 0.0001$), nomeadamente entre o RMI e a FIM motor ($rs = 0.69$, $p < 0.0001$) e, em menor extensão, o RMI com a MI-leg ($rs = 0.36$, $p = 0.002$) e com a TCT ($rs = 0.26$, $p = 0.03$). Contudo, não foram encontrados dados significativos para a FIM cognitiva.

No estudo de Hsieh et al. (2000), a amostra populacional consistiu em 38 utentes após AVC, na qual foi analisada a validade de constructo do RMI comparando os seus resultados com os da BBS. Quer na admissão como na alta, demonstrou elevada correlação, com $r = 0.81$ e $r = 0.89$ ($p < 0.001$), respetivamente.

Hsueh et al. (2003) examinaram 57 utentes de AVC através de três medidas de mobilidade (RMI, mRMI e subescala de mobilidade da STREAM), desde o estado agudo até 180 dias após o AVC. As correlações entre o mRMI e a STREAM foram excelentes ($r \geq 0.92$, $CCI \geq 0.89$), indicando elevada validade convergente em ambas as medidas. Por outro lado, mostrou resultados moderados a elevados quando comparada com o mRMI e a STREAM ($r \geq 0.78$, $CCI \geq 0.50$).

O estudo de Schindl et al. (2000) correlacionou a versão alemã do RMI com o 10MWT e a FIM motor, em amostras diferentes. No centro de reabilitação A, foram avaliados 46 sujeitos em estado agudo de AVC, no qual o coeficiente de correlação Spearman entre o RMI Alemã e o 10MWT correspondeu a 0.734 ($p < 0.001$) na admissão e 0.919 ($p < 0.001$) após 3 semanas. No centro de reabilitação B, foram avaliados 151 sujeitos 88 dias após o AVC, onde se verificou uma correlação significativa na admissão e na alta entre o RMI Alemã e a FIM motor ($r = 0.78$, $p < 0.0001$ e $r = 0.79$, $p < 0.001$, respetivamente.

Validade de critério

Relativamente à validade preditiva, esta foi estudada em dois estudos (Hsieh et al., 2000; Hsueh et al., 2003), ambos através do coeficiente de correlação de Spearman. Mais especificamente, Hsieh et al. (2000) estudaram esta propriedade psicométrica, correlacionando os scores do RMI na admissão com os scores do BI na alta, tendo obtido um $r = 0.77$, $p < 0.001$ (correlação elevada),

In Hsieh et al.'s (2000) study, the study population consisted of 38 post-stroke patients, in which the construct validity of the RMI was analyzed by comparing its results with those of the BBS. The RMI showed high correlation both at admission and discharge, with $r = 0.81$ and $r = 0.89$ ($p < 0.001$), respectively.

Hsueh et al. (2003) examined 57 stroke patients using three mobility measures (RMI, mRMI, and the mobility subscale of the STREAM), from acute to 180 days after stroke. The correlations between the mRMI and the STREAM were excellent ($r \geq 0.92$, $ICC \geq 0.89$), indicating high convergent validity in both measures. On the other hand, moderate to high results were shown when compared to the mRMI and the STREAM ($r \geq 0.78$, $ICC \geq 0.50$).

The study by Schindl et al. (2000) correlated the German version of the RMI with the 10MWT and FIM motor in different samples. At rehabilitation centre A, 46 subjects in the acute stage of stroke were evaluated, where the Spearman correlation coefficient between the German RMI and 10MWT was 0.734 ($p < 0.001$) at admission and 0.919 ($p < 0.001$) after 3 weeks. At rehabilitation centre B, 151 subjects were evaluated 88 days after stroke, where a significant correlation was found between the German RMI and FIM motor at admission and discharge ($r = 0.78$, $p < 0.0001$ and $r = 0.79$, $p < 0.001$, respectively).

Criterion validity

Regarding predictive validity, this was analyzed in two studies (Hsieh et al., 2000; Hsueh et al., 2003), both using the Spearman correlation coefficient. Specifically, Hsieh et al. (2000) studied this psychometric property by correlating RMI scores at admission with BI scores at discharge, obtaining an $r = 0.77$, $p < 0.001$ (high correlation), indicating that mobility at admission to rehabilitation is a potential predictor of functional status at discharge and thus supporting the predictive validity of the RMI.

In addition to studying the correlation of the RMI with the BI, the predictive validity of the mRMI with the BI was also studied at three distinct time points (14, 30, and 90 days post-stroke) with the results obtained on the BI after 180 days post-stroke. Thus, for the RMI, values equivalent to $r = 0.50$, 0.57, and 0.74, respectively, were demonstrated, and for its modified version, results of $r = 0.53$, $r = 0.65$, and $r = 0.83$, respectively, were obtained (Hsueh et al., 2003).

Internal consistency

Four studies (Franchignoni et al., 2003; Pavan et al., 2010; Rådman et al., 2015; Roorda et al., 2008) analyzed the internal consistency of the RMI in the stroke population, one of which evaluated its modified version - mRMI.

In the study by Franchignoni et al. (2003), internal consistency was assessed using two methodologies, 5 weeks after admission. A Cronbach's alpha value equivalent to 0.93

indicando que a mobilidade na admissão da reabilitação é um potencial preditor de estado funcional na alta e, assim sendo, este resultado suporta a validade preditiva do RMI.

Além do estudo da correlação do RMI com o BI, foi também estudada a validade preditiva do mRMI com o BI, em 3 momentos distintos (14, 30 e 90 dias pós-AVC) com os resultados obtidos no BI após 180 dias do AVC. Assim, para o RMI, foram demonstrados valores de r equivalentes a 0.50, 0.57 e 0.74, respetivamente, e para a sua versão modificada, obtiveram-se os resultados de r=0.53, r=0.65 e r=0.83, respetivamente (Hsueh et al., 2003).

Consistência interna

Quatro estudos (Franchignoni et al., 2003; Pavan et al., 2010; Rådman et al., 2015; Roorda et al., 2008) analisaram a consistência interna do RMI na população de AVC, um dos quais avaliou a sua versão modificada - mRMI.

No estudo de Franchignoni et al. (2003), a consistência interna foi avaliada através de duas metodologias, 5 semanas após a admissão. Neste sentido, foi obtido um valor de alpha de Cronbach equivalente a 0.93, bem como um coeficiente de correlação interclasse, item-total entre 0.36 e 0.83, p<0.003, demonstrando, assim, excelentes resultados.

Os autores Pavan et al. (2010), estudaram a consistência interna da versão brasileira do RMI para uma população de 95 utentes pós-AVC, através do alpha de Cronbach por item, cujos valores variaram entre 0.963 e 0.999, p<0.001, e pelo score total, com um resultado equivalente a 0.999, p<0.001, indicando boa consistência interna. Ainda numa outra versão holandesa do RMI (Roorda et al., 2008), foram obtidos resultados significativos (alpha de Cronbach = 0.97) para uma população constituída por 212 utentes pós-AVC.

Rådman et al. (2015), analisaram a consistência interna do mRMI para uma amostra de 37 utentes pós-AVC, tendo apresentado valores de alpha de Cronbach e coeficiente de correlação interclasse (CCI) correspondentes a 0.96 e 0.99, respetivamente.

Fidedignidade inter e intra-observador

Para a análise da fidedignidade intra-observador e inter-observador do RMI, foram encontrados 7 estudos (Chen et al., 2007; Green and Young, 2001; Hsueh et al., 2003; Lennon and Johnson, 2000; Pavan et al., 2010; Rådman et al., 2015; Schindl et al., 2000).

Foram avaliadas ambas as propriedades em 3 estudos. No estudo de Green and Young (2001), para uma população com 22 utentes crónicos de AVC. Relativamente à fidedignidade intra-observador, verificou-se um coeficiente de fidedignidade de apenas 2,2, indicando uma variabilidade baixa, bem como apresentou uma diferença média de 0.3 (95% IC = -0.18-0.82) e um desvio padrão das diferenças equivalente a 1,1. Para a fidedignidade inter-observador, através da análise com os métodos estatísticos Wilcoxon e Bland and Altman, observou-se uma concordância entre itens de 85% - 100% e um índice de Kappa ≥ 0,64 e para o *score* total utilizou-se o método Bland and Altman. Por outro lado, o segundo estudo avaliou a fidedignidade intra-observador para uma população de 30 utentes em fase aguda de AVC, através do método Teste-T emparelhado, obtendo um valor equivalente a t = 0.732, p = 0.47. Para a fidedignidade inter-observador, verificou-se um CCI igual a 0.98, p < 0.001 (95 %

was obtained, as well as an item-total interclass correlation coefficient between 0.36 and 0.83, p<0.003, demonstrating excellent results.

The authors Pavan et al. (2010) studied the internal consistency of the Brazilian version of the RMI for a population of 95 post-stroke patients, through the item-specific Cronbach's alpha, whose values ranged from 0.963 to 0.999, p<0.001, and through the total score, with a result equivalent to 0.999, p<0.001, indicating good internal consistency. In another Dutch version of the RMI (Roorda et al., 2008), significant results (Cronbach's alpha = 0.97) were obtained for a population of 212 post-stroke patients.

Rådman et al. (2015) analyzed the internal consistency of the mRMI for a sample of 37 post-stroke patients, presenting Cronbach's alpha values and interclass correlation coefficient (ICC) corresponding to 0.96 and 0.99, respectively.

Intra-observer and inter-observer reliability

For the analysis of intra-observer and inter-observer reliability of the RMI, seven studies were found (Chen et al., 2007; Green and Young, 2001; Hsueh et al., 2003; Lennon and Johnson, 2000; Pavan et al., 2010; Rådman et al., 2015; Schindl et al., 2000).

Both properties were evaluated in three studies. In Green and Young's (2001) study, for a population of 22 chronic stroke patients, an intra-observer reliability coefficient of only 2.2 was found, indicating low variability, and a mean difference of 0.3 (95% CI = -0.18-0.82) with a standard deviation of differences equivalent to 1.1 was presented. For inter-observer reliability, using Wilcoxon and Bland and Altman statistical methods, there was a 85% - 100% agreement between items and a Kappa index ≥ 0.64, and the Bland and Altman method was used for the total score. On the other hand, the second study evaluated intra-observer reliability for a population of 30 patients in the acute phase of stroke, using the paired t-test method, obtaining an equivalent value of t = 0.732, p = 0.47. For inter-observer reliability, a ICC of 0.98, p < 0.001 (95% CI = 4.46) was found (Lennon and Johnson, 2000).

In the following 2 studies, only the intra-observer reliability was studied, and the results obtained were: ICC equivalent to 0.96 (95% CI = 0.93-0.98) for a sample of 50 patients with chronic stroke (Chen et al., 2007); Wilcoxon values that showed little significant differences for both items (p between 0.157 and > 0.999) and total score (p = 0.334) (Pavan et al., 2010).

The studies by Hsueh et al. (2003) and Schindl et al. (2000) evaluated only inter-observer reliability, where in the first study, k = 0.71 per item and ICC = 0.9 were observed, while in the second study, r = 0.98, p < 0.0012 (75% total agreement) was found.

The authors Hsueh et al. (2003) and Rådman et al. (2015) also studied the reliability values for the modified version of the RMI. Thus, in the Rådman et al. (2015) study, ICC values equal to 0.99 and 0.97 were obtained for intra-observer and inter-observer reliability, respectively, while in the Hsueh et al. (2003) study, k values for each item were found to be 0.72 (0.47-0.9) and ICC equivalent to 0.95 (95% CI = 0.90-0.97).

Sensitivity (responsiveness)

Four studies (Franchignoni et al., 2003; Hsieh et al., 2000;

IC = 4.46) (Lennon and Johnson, 2000).

Nos 2 estudos seguintes, foi estudada apenas a fidedignidade intra-observador, tendo-se obtido os resultados: CCI equivalente a 0.96 (95% IC = 0.93-0.98) para uma amostra de 50 utentes com AVC crónico (Chen et al., 2007); valores de Wilcoxon que demonstraram diferenças pouco significativas quer para os itens (p entre 0,157 e > 0,999), como para o score total (p = 0.334) (Pavan et al., 2010).

Os estudos de Hsueh et al. (2003) e de Schindl et al. (2000), avaliaram apenas a fidedignidade inter-observador, nos quais se verificou, no primeiro, um k = 0.71 por item e um CCI = 0.9 e, no segundo, r = 0.98, p < 0.0012 (75% concordância total).

Os autores Hsueh et al. (2003) e Rådman et al. (2015) estudaram ainda os valores de fidedignidade para a versão modificada do RMI. Desta forma, no estudo de Rådman et al. (2015), foram obtidos valores de CCI igual a 0.99 e CCI igual a 0.97 para a fidedignidade intra e inter-observador, respetivamente, e no estudo de Hsueh et al. (2003), verificou-se valores de k para cada item igual a 0.72 (0.47-0.9) e de CCI equivalente a 0.95 (95% IC = 0.90-0.97).

Sensibilidade (poder de resposta)

Quatro estudos (Franchignoni et al., 2003; Hsieh et al., 2000; Hsueh et al., 2003; Schindl et al., 2000) avaliaram a sensibilidade do RMI, bem como do mRMI, os quais indicaram, na sua globalidade, valores significativos.

No estudo de Franchignoni et al. (2003) foram utilizados os testes de Sinal e de Wilcoxon para analisar a diferença significativa dos resultados da RMI no período de teste. Verificou-se que os mesmos foram estatisticamente significativos apresentando os seguintes valores: Teste do Sinal: z = 7.1, p < 0.0001; Wilcoxon z = 6.28, p < 0.0001; e a magnitude do efeito (ME) foi de 0.89, indicando elevada sensibilidade à mudança.

Relativamente à sensibilidade estudada por Hsieh et al. (2000) foram identificadas melhorias clinicamente significativas, pelo que 76% dos sujeitos progrediram 3 pontos entre os períodos de admissão e alta. Verificou-se também que a relação entre a mudança no *score* da RMI com a BI foi razoável (rs = 0.6, p < 0.001).

Os autores Hsueh et al. (2003) analisaram a sensibilidade de 3 medidas (RMI, mRMI e STREAM) no período pós-AVC, as quais apresentaram resultados de ME ≥ 1.14, p < 0.05 aos 14-30 dias; ME ≥ 0.83, p < 0.05 aos 30-90 dias e ME = 0.2-0.4, p > 0.14 aos 90-180 dias. Assim, apresentaram uma elevada sensibilidade à mudança até os 90 dias pós-AVC (ME > 0.8) e baixa após esse período.

Para avaliar a sensibilidade da versão alemã do RMI, os resultados foram comparados através do Teste de Wilcoxon. A correlação do RMI com as outras medidas em ambos os centros de reabilitação (A e B), tanto nos utentes agudos como crónicos, foi estatisticamente significativa. No centro A, houve um aumento de 6.6 [0; 26.6]% na RMI paralelo à redução de 49.2s [34.1; 54.1]% no 10MWT, e em B deu-se um valor constante no RMI paralelo à constante na FIM-motor 0 [0; 5.71]%. Adicionalmente, foi calculado o coeficiente de Spearman que revelou uma correlação significativa da mudança nos resultados do RMI com os da 10MWT em A (r (A) = 0.87, p > 0.0001) e os da FIM-motor em B (r (B) = 0.54, p > 0.0001 com FIM-motor), enfatizando a sensibilidade nos sujeitos crónicos de AVC (Schindl et al., 2000).

Hsueh et al., 2003; Schindl et al., 2000) evaluated the sensitivity of the RMI, as well as the mRMI, which overall indicated significant values.

In the study by Franchignoni et al. (2003), the Sign and Wilcoxon tests were used to analyze the significant difference of RMI results over the testing period. It was found that they were statistically significant, presenting the following values: Sign test: z = 7.1, p < 0.0001; Wilcoxon z = 6.28, p < 0.0001; and the effect size (ES) was 0.89, indicating high sensitivity to change.

Regarding the sensitivity studied by Hsieh et al. (2000), clinically significant improvements were identified, with 76% of subjects progressing 3 points between admission and discharge periods. It was also found that the relationship between the change in RMI score and BI was reasonable (rs = 0.6, p < 0.001).

The authors Hsueh et al. (2003) analyzed the sensitivity of 3 measures (RMI, mRMI, and STREAM) in the post-stroke period, which showed ME ≥ 1.14, p < 0.05 at 14-30 days; ME ≥ 0.83, p < 0.05 at 30-90 days, and ME = 0.2-0.4, p > 0.14 at 90-180 days. Thus, they presented high sensitivity to change up to 90 days post-stroke (ME > 0.8) and low sensitivity after that period.

To evaluate the sensitivity of the German version of the RMI, the results were compared using the Wilcoxon Test. The correlation of RMI with other measures in both rehabilitation centres (A and B), for both acute and chronic users, was statistically significant. In centre A, there was an increase of 6.6 [0; 26.6]% in RMI parallel to a reduction of 49.2s [34.1; 54.1]% in the 10MWT, and in B there was a constant value in RMI parallel to the constant value in FIM-motor 0 [0; 5.71]%. Additionally, the Spearman coefficient was calculated, which revealed a significant correlation of the change in RMI results with those of the 10MWT in A (r (A) = 0.87, p > 0.0001) and with those of FIM-motor in B (r (B) = 0.54, p > 0.0001 with FIM-motor), emphasizing sensitivity in chronic stroke subjects (Schindl et al., 2000).

Ceiling and Floor Effects

Only one study (Hsueh et al., 2003) evaluated the Ceiling Effect (CE) and Floor Effect (FE) of RMI and mRMI in stroke patients, by percentage of subjects who achieved the highest and lowest scores, respectively. For RMI, values of CE ≤ 6.8% and FE ≤ 40.4% were obtained, while for mRMI, a CE ≤ 16.3% and FE = 0% were observed. Considering that only values above 20% of the sample size are considered significant, only RMI presents a FE.

3.2.4. RESULTS OF THE EVALUATION OF METHODOLOGICAL QUALITY AND MEASUREMENT PROPERTIES QUALITY

In order to summarize the available evidence on the psychometric properties of the RMI and its modified version, a characterization was initially made regarding the risk of bias and quality criteria per study. Table 5 presents the characterization of the validity of RMI and mRMI, Table 6 presents the characterization of reliability, and Table 7 presents the characterization of sensitivity, regarding the risk of bias and quality criteria for the evaluation of measurement properties per study that assessed this property.

Efeito Teto e Efeito Chão

Apenas um estudo (Hsueh et al., 2003) avaliou o Efeito Teto (ET) e Efeito Chão (EC) do RMI e do mRMI em utentes de AVC, através da percentagem dos sujeitos que adquiriram os scores mais altos e baixos, respetivamente. Assim, para o RMI foram obtidos valores de ET ≤ 6.8% e EC≤ 40.4% e, relativamente ao mRMI, verificou-se um ET ≤ 16.3% e EC = 0%. Posto isto, e considerando que apenas valores acima de 20% do tamanho da amostra são considerados significativos, somente a RMI apresenta EC.

3.2.4. RESULTADOS DA AVALIAÇÃO DA QUALIDADE METODOLÓGICA E DA QUALIDADE DAS PROPRIEDADES DE MEDIDA

De forma a resumir a evidência disponível sobre as propriedades psicométricas do RMI e da sua versão modificada, foi inicialmente efetuada uma caracterização das mesmas quanto ao risco de viés e aos critérios de qualidade por estudo. Na Tabela 5 apresenta-se a caracterização da validade do RMI e do mRMI, na Tabela 6 a caracterização da fidedignidade e na Tabela 7 da sensibilidade, quanto ao risco de viés e aos critérios de qualidade para a avaliação das propriedades de medida, por estudo que avaliou esta propriedade.

3.2.5. SYNTHESIS OF EVIDENCE

For the synthesis of evidence, the results were summarized for each property, the consistency of the results was verified, and the GRADE criteria adapted by COSMIN were applied.

Based on the results in Table 8, we can state that, regarding validity, there is high evidence that the RMI has adequate structural validity, convergent validity, predictive validity, and concurrent validity.

Regarding reliability, there is high evidence that the RMI has adequate internal consistency; for intra-observer reliability and standard error of measurement, there is moderate evidence that these properties are adequate; for inter-observer reliability, the level of evidence is low.

Regarding sensitivity, there is high-level evidence that the RMI is a sensitive outcome measure for detecting changes. For the mRMI, there is high-level evidence that this outcome measure has adequate convergent and criterion validity, as well as sensitivity to change. Regarding reliability, there is high-level evidence that the mRMI has adequate internal consistency. However, for intra-observer and inter-observer reliability, there is moderate and low-level evidence, respectively, that these properties are adequate.

Tabela/Table 5: Caracterização da validade do RMI e do mRMI quanto ao risco de viés e aos critérios de qualidade para a avaliação das propriedades de medida/Characterization of the validity of the RMI and mRMI regarding the risk of bias and the quality criteria for the assessment of measurement properties.

Instrumento de medida/ Measurement Instrument	Estudo/Study	Validade de conteúdo/ Content validity		Validade estrutural/ Structural validity		Validade convergente/ Convergent validity		Validade de critério/ Criterion validity	
		QM/MQ	QP/PQ	QM/MQ	QP/PQ	QM/MQ	QP/PQ	QM/MQ	QP/PQ
RMI	Antonucci et al. (2002)	PNE/NSP	PNE/NSP	Adequada/ Adequate	+	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP
	Franchignoni et al. (2003)	PNE/NSP	PNE/NSP	Inadequada/ Inadequate	+	Inadequada/ Inadequate	+	PNE/NSP	PNE/NSP
	Hsieh et al. (2000)	PNE/NSP	PNE/NSP	Inadequada/ Inadequate	+	Muito boa/ Very good	+	Muito boa/ Very good	+
	Hsueh et al. (2003)	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP	Muito boa/ Very good	?	Muito boa/ Very good	+
	Roorda et al. (2008)	PNE/NSP	PNE/NSP	Muito boa/ Very good	+	Adequada/ Adequate	+	PNE/NSP	PNE/NSP
	Schindl et al. (2000)	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP	Adequada/ Adequate	?	PNE/NSP	PNE/NSP
mRMI	Hsueh et al. (2003)	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP	Muito boa/ Very good	?	Muito boa/ Very good	+
	Lennon & Johnson (2000)	Adequada/ Adequate	NA	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP

Legenda/Legends: RMI – Rivermead Mobility Index; mRMI – modified Rivermead Mobility Index; QM – Qualidade Metodológica (risco de viés)/MQ – Methodological Quality (risk of bias); QP – Qualidade da Propriedade/PQ – Property Quality; (+) – suficiente/enough; (?) – indeterminada/undetermined; (-) – insuficiente/insufficient; PNE- Propriedade Não Estudada/NSP – Non-Study Property; NA – Não Aplicável/Not Applicable.

Tabela/Table 6: Caracterização da fidedignidade do RMI e do mRMI quanto ao risco de viés e aos critérios de qualidade para a avaliação das propriedades da medida/ Characterization of the reliability of the RMI and mRMI regarding the risk of bias and the quality criteria for the assessment of measurement properties.

Instrumento de medida/ Measurement Instruments	Estudo/ Study	Fidedignidade intra-observador/ Intra-rater reliability		Fidedignidade inter-observador/ Inter-rater reliability		Consistência interna/ Internal consistency		Erro padrão de medição/ Measurement standard error	
		QM/MQ	QP/PQ	QM/MQ	QP/PQ	QM/MQ	QP/PQ	QM/MQ	QP/PQ
RMI	Chen et al. (2007)	Doubt/ Duvidosa	+	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP	Doubt/ Duvidosa	?

RMI	Franchignoni et al. (2003)	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP	Inadequada/ Inadequate	+	PNE/NSP	PNE/NSP
	Green et al. (2003)	Doubt/ Duvidosa	?	Doubt/ Duvidosa	-	PNE/NSP	PNE/NSP	Doubt/ Duvidosa	?
	Hsueh et al. (2003)	PNE/NSP	PNE/NSP	Inadequada/ Inadequate	+	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP
	Pavan et al. (2010)	Inadequada/ Inadequate	?	Inadequada/ Inadequate	+	Muito boa/ Very good	+	PNE/NSP	PNE/NSP
	Lennon & Johnson (2000)	Inadequada/ Inadequate	?	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP
	Rådman et al. (2015)	Inadequada/ Inadequate	+	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP
	Roorda et al. (2008)	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP	Muito boa/ Very good	+	PNE/NSP	PNE/NSP
	Schindl et al. (2000)	Inadequada/ Inadequate	?	Inadequada/ Inadequate	?	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP
mRMI	Hsueh et al. (2003)	Inadequada/ Inadequate	+	Inadequada/ Inadequate	+	PNE/NSP	PNE/NSP	PNE/NSP	PNE/NSP
	Lennon & Johnson (2000)	Inadequada/ Inadequate	+	Inadequada/ Inadequate	+	Doubt/ Duvidosa	+	PNE/NSP	PNE/NSP
	Rådman et al. (2015)	Inadequada/ Inadequate	+	Inadequada/ Inadequate	+	Muito boa/ Very good	+	PNE/NSP	PNE/NSP

Legenda/Legends: RMI – Rivermead Mobility Index; mRMI – modified Rivermead Mobility Index; QM – Qualidade metodológica (risco de viés)/MQ – Methodological Quality (risk of bias); QP-Qualidade da propriedade/QP - Property Quality; (+) – suficiente/enough; (?) – indeterminada/undetermined; (-) – insuficiente/insufficient; PNE – Propriedade Não Estudada/NSP – Non-Study Property.

Tabela/Table 7: Caracterização da sensibilidade do RMI e do mRMI quanto ao risco de viés e aos critérios de qualidade para a avaliação das propriedades de medida/Characterization of the responsivness of the RMI and mRMI regarding the risk of bias and the quality criteria for the assessment of measurement properties.

Instrumento de medida/ Measurement Instruments	Estudo/Study	Sensibilidade/Responsivness	
		QM/MQ	QP/PQ
RMI	Franchignoni et al. (2003)	Inadequada/Inadequate	+
	Hsieh et al. (2000)	Muito boa/Very good	+
	Hsueh et al. (2003)	Muito boa/Very good	+
	Schindl et al. (2000)	Inadequada/Inadequate	-
mRMI	Hsueh et al. (2003)	Muito boa/Very good	+
	Lennon & Johnson (2000)	Inadequada/Inadequate	?

Legenda/Legends: RMI – Rivermead Mobility Index; mRMI – modified Rivermead Mobility Index; QM – Qualidade metodológica (risco de viés)/MQ – Methodological Quality (risk of bias); QP – Qualidade da propriedade/QP - Property Quality; (+) – suficiente/sufficient; (?) – indeterminada/undetermined; (-) – insuficiente/insufficient.

3.2.5. SÍNTESE DA EVIDÊNCIA

Para a síntese da evidência, resumiram-se os resultados para cada uma das propriedades, verificou-se a consistência dos resultados e aplicaram-se os critérios adaptados da GRADE adaptados pela COSMIN.

Tendo em conta os resultados da tabela 8 podemos afirmar que, em relação à validade, existe evidência elevada, de que o RMI possui validade estrutural, validade convergente, validade preditiva e validade concorrente adequadas.

Em relação à fidedignidade, existe evidência elevada de que o RMI possui consistência interna adequada; para a fidedignidade intra-observador e para o erro padrão de medida existe evidência moderada de que estas propriedades são adequadas; para a fidedignidade inter-observador o nível de evidência é baixo.

No que diz respeito à sensibilidade existe evidência elevada

4. DISCUSSION

The present study synthesized the evidence on the psychometric properties of the most comprehensive MI, from the perspective of the ICF categories covered, that evaluates FM in adult individuals with sequelae of stroke, which is the RMI, according to the literature.

In the first stage, to determine the most appropriate MI, considering the ICF categories, a correspondence between the definition of FM and the ICF categories was performed according to a questionnaire submitted to a panel of experts. Some of the categories from the Mobility chapter (chapter 4 of the ICF) that were part of the established definition were included. However, within those excluded, some experts considered "d430-d449 Transporting, moving and handling objects" and "d4750 Driving a human-powered transportation

de que o RMI é um IM sensível às mudanças.

Para o mRMI, verificou-se que existe evidência elevada de que este IM possui uma validade convergente e de critério adequadas, bem como para a sensibilidade à mudança. Relativamente à fidedignidade, existe evidência elevada de que o mRMI apresenta uma consistência interna adequada, no entanto, para a fidedignidade intra-observador e inter-observador, existe evidência moderada e baixa, respetivamente de que estas propriedades são adequadas.

device" as categories included in the definition of FM, which may constitute a limitation to the study. In addition, the consensus was not reached using the most appropriate technique described in the literature (Delphi Panel), due to time limitations, and the list of experts was smaller than expected due to a lack of participation in the questionnaire via email. In contrast, the clinical experience of the panel of experts who responded to the questionnaire was noteworthy.

Tabela/Table 8: Síntese da evidência para cada uma das propriedades/Summary of evidence for each of the properties.

Propriedade/Property	Escala/Measurement instrument	Síntese dos resultados/ Summary of the results	Consistência dos resultados/ Consistency of the results	Nível de evidência/ Level of evidence
Validade estrutural/ Structural validity	RMI	Nenhum item ameaça a validade e a unidimensionalidade da escala Forte unidimensionalidade/No item threatens the validity and unidimensionality of the scale Strong unidimensionality CR/RC = 0.93-0.95 CE/SC = 0.67-0.79	+ (consistente/consistent)	Elevada: 1 estudo muito bom/ High: 1 study very good
Validade convergente/ Convergent validity	RMI	Com FIMmotor, FIMcog, MI-leg e TCT: r > 0.49 para todas, p < 0.0001 (exceto c/ FIMcog)/With FIMmotor, FIMcog, MI-leg e TCT: r > 0.49 for all, p < 0.0001 (except with FIMcog) Com BBS/With BBS: r = 0.81-0.89 Com mRI e STREAM/With mRMI e STREAM: r ≥ 0.78 Com 10 MM/With 10 MM: r = 0.73-0.92	? (inconsistente/inconsistent)	Elevada: 1 estudo muito bom (análise apenas dos valores positivos)/High: 1 study very good (analysis of positive values only)
	mRMI	Com STREAM/With STREAM: r ≥ 0.92	? (consistente/consistent)	Elevada: 1 estudo muito bom/ High: 1 study very good
Validade de critério/ Criterion validity	RMI	Concorrente/Concurrent: r = 0.67-0.88 Preditiva/Predictive: r = 0.50-0.77	+ (consistente/consistent)	Elevada: 2 estudos muito bons/ High: 2 studies very good
	mRMI	Concorrente/Concurrent: r = 0.82-0.89 Preditiva/Predictive: r = 0.53-0.83	+ (consistente/consistent)	Elevada: 1 estudo muito bom/ High: 1 study very good
Consistência interna/ Internal consistency	RMI	? = 0.93-0.99	+ (consistente/consistent)	Elevada: 2 estudos muito bons/ High: 2 studies very good
	mRMI	? = 0.93-0.96	+ (consistente/consistent)	Elevada: 1 estudo muito bom/ High: 1 study very good
Fidedignidade intra-observador/ Intra-rater reliability	RMI	CCI/ICC = 0.96 Coeficiente de Fidedignidade/ Reliability coefficient = 2.2	? (inconsistente/inconsistent)	Moderada: 2 estudos duvidosos (análise apenas dos valores positivos)/Moderate: 2 doubtful studies (analysis of positive values only)
	mRMI	CCI/ICC = 0.99 t= 0.732	+ (consistente/consistent)	Baixa: 3 estudos inadequados/ Low: 3 inadequate studies
Erro padrão de medida/ Standard error of measurement	RMI	EPM/SEm = 0.8 DMD/MDD = 2.2	? (consistente/consistent)	Moderada: 2 estudos duvidosos/Moderate: 2 doubtful studies
Fidedignidade inter-observador/ Inter-rater reliability	RMI	CCI/ICC = 0.92 k ≥ 0.64 rs = 0.98	- (inconsistente/inconsistent)	Baixa: 2 estudos inadequados (análise apenas dos valores positivos)/Low: 2 inadequate studies (analysis of positive values only)
	mRMI	CCI/ICC = 0.95-0.98 k = 0.72	+ (consistente/consistent)	Baixa: 3 estudos inadequados / Low: 3 inadequate studies
Sensibilidade/ Responsivness	RMI	Teste de Sinal/Sign test: z = 7.1 Teste de Wilcoxon/Wilcoxon test: z = 6.28 ME/ES = 0.2-1.14 r = 0.6 ET/CE ≤ 6.8% EC/FE ≤ 40.4%	(inconsistente/inconsistent)	Elevada: 2 estudos muito bons (análise apenas dos valores positivos)/High: 2 studies very good (analysis of positive values only))

Sensibilidade/Responsivness	mRMI	ME/ES = 1.15 ET/CE ≤ 16.3 % EC/FE = 0 %	? (inconsistente/inconsistent)	Elevada: 1 estudo muito bom (análise apenas dos valores positivos) / High: 1 study very good (analysis of positive values only))

Legenda/Legends: RMI – Rivermead Mobility Index; mRMI – modified Rivermead Mobility Index; CR - Coeficiente de Reprodutibilidade/RC – Reproducibility coefficient; CE - Coeficiente de Escalabilidade/SC – Scalability Coefficient; FIMcog – cognitive subscale of Functional Independence Measure; FIMmotor – motor subscale of Functional Independence Measure; MI-leg – leg section of Motricity Index; TCT – Trunk Control Test; r ou rs – coeficiente correlação de Spearman/Spearman correlation coefficient; BBS - Berg Balance Scale; STREAM – Stroke Rehabilitation Assessment of Movement; ?- Coeficiente Alpha de Cronbach/Alpha de Cronbach coefficient; CCI - Coeficiente de Correlação Intraclasse/ICC - Interclass Correlation Coefficient; t – Test-T emparelhado/paired T-Test; EPM - Erro Padrão de Medida/SEm - Standard error of measurement; DMD - Diferença Mínima Detetável/DD - Minimum detectable difference; k - Estatística Kappa/Kappa statistics; ME - Magnitude do efeito/ES – Effect Size; ET - Efeito teto/CE – Ceilling Effect; EC - Efeito chão/FE – Floor Effect.

4. DISCUSSÃO

O presente estudo sintetizou a evidência sobre as propriedades psicométricas do IM mais completo, do ponto de vista das categorias da CIF abrangidas que, segundo a literatura, avalia a MF no indivíduo adulto com sequelas de AVC, que é o RMI.

Numa primeira etapa, para determinar o IM mais adequado, tendo em conta as categorias da CIF, realizou-se a correspondência da definição de MF com as categorias CIF segundo um questionário submetido a um painel de peritos. Foram incluídas algumas das categorias do capítulo de mobilidade (capítulo 4 da CIF) que faziam parte da definição estabelecida. No entanto, dentro das que foram excluídas, alguns peritos consideraram "d430-d449 Transportar, mover e manusear objectos" e "d4750 Conduzir um meio de transporte com tracção humana" como categorias integrantes na definição de MF, o que pode constituir uma limitação ao estudo. Em adição, o consenso não foi realizado segundo a técnica mais adequada descrita na literatura (Painel de Delphi), por limitações temporais, bem como a lista de peritos foi mais reduzida do que o previsto, pela falta de participação no questionário via e-mail. Em contraste, destaca-se a experiência clínica dos peritos que constituíram o Painel que responderam ao questionário.

A elaboração da *Scoping Review* teve como objetivo identificar os IM que referem avaliar a MF, tendo a pesquisa sido efetuada em diversas bases de dados para a obtenção do maior número de estudos. Deste modo, foram identificados um total de 39 IM, com diferentes idiomas e versões. Os IM mais mencionados na revisão bibliográfica foram a TUG e seguidamente a RMI. Adicionalmente, no processo de extração de dados, confirmou-se que a definição de MF mais referida foi a de Forhan and Gill (2013). Tendo em conta que a TUG foi a mais mencionada, seria interessante fazer estudos sobre as propriedades psicométricas da RMI em comparação com as da TUG, uma vez que é um dos instrumentos mais mencionados e, apesar de não ter tantas categorias CIF como a RMI, é possível que também seja útil uma vez que também possui boas propriedades psicométricas, tal como afirmado por Hafsteinsdóttir et al. (2014).

De forma a averiguar qual o instrumento que contempla mais categorias CIF, procedeu-se à correspondência dos IM com a CIF. É de realçar que não é comum ver este tipo de correspondência nestes estudos, mas segundo Moshki et al. (2018) é importante utilizar a CIF como referência independente e externa para representar o conteúdo dos IM, de forma a ser possível explorar esses conteúdos de forma abrangente,

The aim of the Scoping Review was to identify the MI that assess FM, with the search being conducted in several databases to obtain the highest number of studies. Thus, a total of 39 MIs were identified, with different languages and versions. The most mentioned MIs in the literature review were the TUG and, subsequently, the RMI. Additionally, in the process of data extraction, it was confirmed that the most referenced definition of FM was that of Forhan and Gill (2013). Considering that the TUG was the most mentioned, it would be interesting to conduct studies on the psychometric properties of the RMI compared to those of the TUG, since it is one of the most mentioned instruments and, although it does not have as many ICF categories as the RMI, it may also be useful since it also has good psychometric properties, as stated by Hafsteinsdóttir et al. (2014).

In order to investigate which instrument encompasses more ICF categories, we corresponded the outcome measures with the ICF. It is noteworthy that this type of correspondence is not commonly seen in these studies, but according to Moshki et al. (2018), it is important to use the ICF as an independent and external reference to represent the content of outcome measures, in order to explore these contents comprehensively, standardized and transparently. Furthermore, as stated by Velstra et al. (2011), comparisons based on ICF categories enable the selection of outcome measures that best address the domain of functionality regarding a certain rehabilitation intervention. To minimize bias in the correspondence process, this step could have been performed by experts. However, this limitation was due to their lack of availability. Finally, the outcome measure with the most correspondences was the RMI, which led us to consider studying its psychometric properties.

It is worth noting that the Academy of Neurologic Physical Therapy (ANPT) has been working to relate outcome measures used in neurological physical therapy to ICF dimensions, aiming for a more effective and patient-centered approach to neurological patients. An example of this work is the development of the Neurology Section Outcome Measures Recommendations Project, which is a collaborative effort to identify and characterize the most appropriate outcome measures for evaluation and intervention in neurological physical therapy. Additionally, the ANPT has promoted research in the area of outcome measures in neurological physical therapy and encouraged the use of outcome measures related to ICF dimensions. It was in this sense that we developed this survey of outcome measures that evaluate functional mobility and their correspondence with the ICF, which will allow us to comprehensively evaluate the results

padronizada e transparente. Ainda segundo Velstra et al. (2011) as comparações baseadas nas categorias CIF permitem a seleção de medidas de resultado que melhor abordam o domínio da funcionalidade em relação a uma determinada intervenção em reabilitação. De forma a minimizar o viés no processo de correspondência, esta etapa poderia ter sido realizada por peritos. Esta limitação deveu-se à falta de disponibilidade dos mesmos. Por fim, o IM com mais correspondências foi a RMI, pelo que se considerou o estudo das suas propriedades psicométricas.

De referir que a *Academy of Neurologic Physical Therapy* (ANPT) tem trabalhado para relacionar os instrumentos de medida usados em fisioterapia neurológica com as dimensões da CIF, visando uma abordagem mais eficaz e centrada no doente neurológico. Um exemplo desse trabalho é o desenvolvimento do *Neurology Section Outcome Measures Recommendations Project*, que é um esforço colaborativo para identificar e caracterizar os instrumentos de medida mais apropriados para a avaliação e intervenção em fisioterapia neurológica. Além disso, a ANPT tem promovido a investigação na área de medidas de resultado em fisioterapia neurológica e incentivado a utilização de instrumentos de medida que estejam relacionados com as dimensões da CIF. Foi nesse sentido que desenvolvemos este trabalho de levantamento dos IM que avaliam a mobilidade funcional e sua correspondência com a CIF, o que nos permitirá avaliar de forma abrangente os resultados da intervenção em fisioterapia neurológica. Acreditamos que o nosso trabalho contribuirá para a melhoria da prática clínica em fisioterapia neurológica, proporcionando uma abordagem mais precisa e centrada no utente, em consonância com as recomendações da ANPT.

Posto isto, fez-se uma Revisão Sistemática, com o intuito de rever na literatura as propriedades psicométricas deste instrumento, nomeadamente validade, fidedignidade e sensibilidade, bem como a qualidade das mesmas. Nesta última etapa, foi utilizada a *"COSMIN Risk of Bias checklist"* para a análise metodológica dos estudos incluídos, os critérios de qualidade presentes na COSMIN para a avaliação das propriedades de medida, e os critérios adaptados da GRADE para a classificação do nível de evidência. Desta forma, foi possível fazer a síntese da melhor evidência.

A síntese da evidência mostrou que existe evidência elevada de que o RMI é um IM válido, sensível às mudanças e que possui consistência interna adequada. No que diz respeito à fidedignidade, existe evidência moderada que possui consistência interna e fidedignidade intra-observador adequada e evidência baixa de que possuí fidedignidade inter-observador adequada. O mRMI, na sua globalidade, para as três propriedades estudadas mostrou ser um IM com evidência elevada. Porém, para a fidedignidade intra-observador e inter-observador, apresenta evidência moderada e baixa, respetivamente.

Sugere-se a realização de mais estudos que avaliem as propriedades psicométricas dos IM RMI e mRMI, nomeadamente da validade de conteúdo e da fidedignidade intra e inter-observador.

Como limitação da Revisão Sistemática, destaca-se ainda a discrepância entre o nome da propriedade psicométrica

of intervention in neurological physical therapy. We believe that our work will contribute to the improvement of clinical practice in neurological physical therapy, providing a more precise and patient-centered approach, in line with ANPT recommendations.

Given that, a Systematic Review was conducted with the purpose of reviewing the psychometric properties of this instrument in the literature, namely validity, reliability, and sensitivity, as well as their quality. In this last step, the "COSMIN Risk of Bias checklist" was used for the methodological analysis of the included studies, the quality criteria present in COSMIN for the evaluation of measurement properties, and the criteria adapted from GRADE for the classification of the level of evidence. This allowed for the synthesis of the best evidence.

The evidence synthesis showed that there is high evidence that the RMI is a valid and sensitive outcome measure with adequate internal consistency. Regarding reliability, there is moderate evidence that it has adequate internal consistency and intra-observer reliability, and low evidence that it has adequate inter-observer reliability. Overall, the mRMI showed high evidence for the three properties studied. However, for intra- and inter-observer reliability, it showed moderate and low evidence, respectively.

Further studies evaluating the psychometric properties of RMI and mRMI, particularly in terms of content validity and intra- and inter-observer reliability, are suggested.

As a limitation of the Systematic Review, it is worth noting the discrepancy between the evaluated psychometric property (convergent/concurrent validity) and its applicability in the studies, which made the analysis difficult and may have biased some of the results.

This investigation aimed to be as comprehensive as possible by including multiple databases and various keywords. However, aspects of validity and reliability of outcome measures are often published in master's and/or doctoral theses, and the current research was not specific to these types of publications. Thus, it is possible that some studies, particularly those published in Portuguese, may not have been selected by the search strategies used in this review.

The heterogeneity in the methodological designs used, statistical analyses, psychometric properties measured, and patients included in the studies made it difficult to draw more solid conclusions, which may limit the interpretation of the investigated psychometric properties. Furthermore, the included studies provided poor descriptions of how the RMI was applied, and when these descriptions existed, they differed considerably.

Despite having some limitations, this review can be useful for researchers and healthcare professionals in identifying the most comprehensive outcome measure to assess FM in the stroke population and whether RMI is a valid, reliable, and sensitive measure for evaluating FM, for use and decision-making in clinical practice and/or research.

5. CONCLUSIONS

FM is an important component to be evaluated in the population with stroke sequelae, whose concept is vaguely

avaliada (validade convergente/concorrente) e a sua aplicabilidade nos estudos, o que dificultou a análise e poderá ter enviesado alguns dos resultados.

Pretendeu-se que esta investigação fosse o mais abrangente possível ao incluir várias bases de dados e diversas palavras-chave. Todavia, aspetos da validade e fidedignidade de IM são, muitas vezes, publicados em teses de mestrado e/ou doutoramento e a atual pesquisa não foi específica para estes tipos de publicação. Assim, é possível que alguns estudos, em particular publicados em português, não tenham sido selecionados pelas estratégias de pesquisa utilizadas nesta revisão.

A heterogeneidade existente nos desenhos metodológicos utilizados, nas análises estatísticas usadas, nas propriedades psicométricas medidas e nos utentes incluídos nos estudos, dificultaram a obtenção de conclusões mais sólidas, o que pode limitar a interpretabilidade das propriedades psicométricas investigadas. Para além do mais, os estudos incluídos forneceram descrições pobres de como o RMI foi aplicada e quando existiram essas descrições, estas diferiam consideravelmente.

Embora apresente algumas limitações, esta revisão pode ser útil para investigadores e profissionais de saúde na identificação do IM mais completo para avaliar a MF na população de AVC e se o RMI é uma medida válida, fidedigna e sensível na avaliação da MF, para utilização e tomada de decisão na prática clínica e/ou investigação.

5. CONCLUSÕES

A MF é uma componente importante a ser avaliada na população com sequelas de AVC, cujo conceito é vagamente definido na literatura e inexistente na CIF. A *Scoping Review* realizada, verificou que o TUG e o RMI foram os IM mais referenciados na literatura para a avaliação da mesma. Ainda assim, a RMI mostra ser o mais completo à concordância com as categorias CIF incluídas na definição de MF.

Recomenda-se a utilização do RMI ou da sua versão modificada (mRMI) como instrumento de avaliação da MF em utentes que sofreram um AVC, pelas boas propriedades psicométricas que apresentam, embora sejam necessários ainda mais estudos para algumas delas, nomeadamente para a validade de conteúdo e fidedignidade intra e inter-observador. Sugere-se também a adaptação cultural e a validação do RMI para a população portuguesa.

CONFLITO DE INTERESSES

Os autores declaram não haver conflitos de interesse.

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CONTRIBUIÇÕES AUTORAIS

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defined in the literature and non-existent in the ICF. The Scoping Review carried out verified that the TUG and the RMI were the most referenced MIs in the literature for its evaluation. Nonetheless, RMI appears to be the most comprehensive in agreement with the ICF categories included in the definition of FM.

We recommend the use of RMI or its modified version (mRMI) as an assessment tool for FM in individuals who have suffered a stroke due to their good psychometric properties, although further studies are still needed for some of them, namely for content validity and intra- and inter-observer reliability. We also suggest the cultural adaptation and validation of the RMI for the Portuguese population.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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Conceptualization, H.S., M.E.M, and I.B.; methodology, H.S., M.E.M, B.S., I.G., I.P, S.C., T.A.; software, H.S.; investigation, H.S., M.E.M, B.S., I.G., I.P, S.C., T.A.; data curation, H.S.; writing - original draft preparation, H.S., M.E.M, B.S., I.G., I.P, S.C., T.A., C.S.; writing - review and editing, H.S., M.E.M, and R.B.; All authors have read and agreed to the published version of the manuscript.

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