Multidimensional frailty assessment tools for use in the care of older adults with cardiovascular disease

Instrumentos de avaliação multidimensional de fragilidade para uso no cuidado de idosos com doença cardiovascular

Instrumentos de evaluación multidimensional de la fragilidad en la atención de adultos mayores con enfermedad cardiovascular

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ABSTRACT
Objective: identify which tools are available for multidimensional frailty assessment of older adult with cardiovascular disease and which are potentially applicable during the Nursing Process. **Method:** a systematic review conducted in eight databases/portals to identify studies that presented multidimensional frailty assessment tools for older adult with cardiovascular disease and that were applicable to the nursing process. **Results:** a total of 19 multidimensional tools were included. The Brief Frailty Index for Coronary Artery Disease was developed for use in the cardiovascular care of older adult. The Frailty Index for Adults and the Maastricht Frailty Screening Tool for Hospitalized Patients were developed for use in the Nursing Process. **Conclusion:** although only one tool was developed for older adults with cardiovascular disease and only two are applicable to the nursing process, most of them have the potential to be adapted and validated for use in this population during nursing assessment.
Descriptors: Aging; Frailty; Cardiovascular Diseases; Assessment Tools; Nursing Process.

RESUMO
Objetivo: identificar quais os instrumentos disponíveis para avaliação multidimensional da fragilidade em idosos com doença cardiovascular, potencialmente aplicáveis durante a realização do Processo de Enfermagem. **Método:** revisão sistemática conduzida em oito bases de dados/portais, para identificação de estudos que apresentassem instrumentos multidimensionais de avaliação de fragilidade em idosos com doença cardiovascular e que fossem aplicáveis ao processo de enfermagem. **Resultados:** foram incluídos 19 instrumentos multidimensionais. O *Brief Frailty Index for Coronary Artery Disease* foi desenvolvido para uso no cuidado cardiovascular de idosos. O *Frailty Index for Adults* e o *Maastricht Frailty Screening Tool for Hospitalized Patients* foram desenvolvidos para uso no Processo de Enfermagem. **Conclusão:** apesar de apenas um instrumento ter sido desenvolvido para o idosos com doença cardiovascular e apenas dois serem aplicáveis ao processo de enfermagem, a maioria deles tem potencial de adaptação e validação para uso nesta população durante a avaliação de enfermagem.
Descritores: Envelhecimento; Fragilidade; Doenças Cardiovasculares; Instrumentos de Avaliação; Processo de Enfermagem.

RESUMEN
Objetivo: identificar qué instrumentos están disponibles para la evaluación multidimensional de la fragilidad en personas mayores con enfermedad cardiovascular, que se puedan aplicar en el Proceso de Enfermería. **Método:** revisión sistemática realizada en ocho bases de datos/portales, para identificar estudios que presentaran instrumentos multidimensionales para la evaluación de la fragilidad en adultos mayores con enfermedad cardiovascular y que fueran aplicables al proceso de enfermería. **Resultados:** se incluyeron 19 instrumentos multidimensionales. El *Brief Frailty Index for Coronary Artery Disease* se desarrolló para usarlo en el cuidado cardiovascular de las personas mayores. El *Frailty Index for Adults* y la *Maastricht Frailty Screening Tool for Hospitalized Patients* se elaboraron para ser usados en el Proceso de Enfermería. **Conclusión:** aunque sólo se elaboró un instrumento para adultos mayores con enfermedad cardiovascular y sólo dos son aplicables al proceso de enfermería, la mayoría de ellos tienen el potencial para ser adaptados y validados para ser usados en esa población en la evaluación de enfermería.
Descriptores: Envejecimiento; Fragilidad; Enfermedades Cardiovasculares; Instrumentos de Evaluación; Proceso de Enfermería.

INTRODUCTION

The state of frailty is a health indicator considered increasingly important in the care of older adults, representing a public health issue[1-5]. Its accurate assessment is essential and mandatory not only in cardiovascular care scenarios, but in all scenarios where an older adult is the focus of care.

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Assessing older adults requires professionals' specific knowledge, experience, and specialized clinical skills. However, the use of assessment tools is also necessary. Many health phenomena are not directly observable and therefore require measuring tools to help professionals detect and/or classify them. The state of frailty is one of the phenomena that benefits from the use of measurement tools for its assessment, especially when used in the cardiovascular care of older adults, as they will serve as support for objective assessment, aligning the operational definition of frailty with its conceptual definition and making it less abstract, stereotyped and less based on primary conceptual models.

Some systematic reviews with different perspectives have been published in the last decade to present tools available for assessing frailty [6-7]. These review studies were justified by the large number of tools available for use. Of all these reviews, only one was designed to identify multidimensional frailty assessment tools [6], but it is currently out of date, not only because of the tools that have been created since its publication but also because of the evolution of concepts. Currently, frailty is understood as a dynamic and multidimensional condition[1], so an assessment tool must be able to capture these aspects.

Despite the understanding that assessing the state of frailty is necessary, no study has sought to identify which frailty assessment tools are used in the cardiovascular care of older adults that can be used to support the nurse's assessment in the nursing process. This assessment is important since frailty increases morbidity and mortality in older adults with cardiovascular disease[5,8]. This study aimed to identify which tools are available for assessing frailty in older adults with cardiovascular disease and which are potentially applicable when carrying out the Nursing Process (NP).

METHODS

A systematic review of the literature investigated the tools developed to assess frailty in older adults with clinical or surgical cardiovascular disease. This review was conducted according to the Cochrane methodology[9].

The study procedures were divided into 3 stages: 1) investigation of the tools available for multidimensional frailty assessment of older adults; 2) verification, among the tools identified, which ones have been developed and validated for use in the cardiovascular care of older adults; 3) analysis of the potential applicability of the tools identified to be used as a subsidy for the Nursing process in the cardiovascular care of older adults at different levels of care complexity (primary care, hospital care, emergency services and intensive therapy).

Review of available tools for assessing frailty in older adults

The following research question was used to guide the search for studies and the structuring of the PICOTT strategy: *"What tools are available for the multidimensional frailty assessment of older adults?".* The acronym PICOTT used corresponded to: *P* (patient or problem) – older adults (≥ 60 years); *I* (intervention) – multidimensional assessment tools; *C* (comparison) – not applicable; *O* (Outcome) – frailty; *T* (type of research question) – diagnostic; *T* (type of study) – a validation study. The searches were carried out in July 2023 and revised in January 2024 on the following electronic databases/portals: Medline, Lilacs, BDEnf, Scopus, Cinahl, Web of Science, Embase, and Cochrane. Based on MeSH terms, the search strategy constructed and used was: *"Frailty AND (older OR elder* OR geriatr*) AND (measure* OR assess*) and Validation Studies".*

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flowchart [10] was used to guide the inclusion of studies. After removing duplicate studies, the initial selection was made by analyzing the Title and Abstract, and then, to decide on inclusion, the full text was read. The studies included were those in which: the main objective was to develop and/or validate a tool for assessing frailty in older adults; the tool was developed specifically to assess frailty; the tool developed was multidimensional; the study clearly described the procedures for developing and/or validating a tool for assessing frailty; the study presented the application of a new tool, in its first version; and the study population was aged ≥60 years. The following studies were excluded: the tool assessed constructs related to frailty, but not frailty *per se* (e.g. functional loss, disability, mortality); one-dimensional tools; the study did not present a measuring tool but a risk prediction model; the tool was a risk score for mortality or other clinical outcomes and; the study consisted of cross-cultural adaptation of the tool to another culture/population, subsequent validations or variations of a measurement tool.

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The methodological quality of the studies for inclusion was analyzed using criteria defined by the principal investigator, based on a psychometric theoretical framework[11,12]. The criteria consisted of: Q1 - Is there a clear definition of the phenomenon being measured; Q2 - Is the origin of the phenomenon clear (is there a theory, conceptual or disease model used or has a clear reason been presented to define the phenomenon being measured?); Q3 - Has it been provided with a clear definition of the context in which the tool will be used? Q4 - Was the tool developed on a population representative of the target population for which the tool was developed? Q5 - Have the procedures for constructing the tool been presented? Q6 - Have the procedures for validating the tool been presented? Q7 - Were the procedures for analyzing the reliability of the tool presented?

All studies that achieved an 'include' recommendation in the methodological quality assessment were included. These studies had to be considered eligible (based on the inclusion criteria listed above) and of adequate quality (they met the initial quality requirements) to achieve a recommendation for inclusion. The review was conducted by two independent reviewers and any disagreements regarding the final inclusion decision were analyzed by a third reviewer.

The following data was extracted from the included studies: author and year of publication; name of the tool and its acronym; language of the tool; characteristics of the development/validation study (study design and sample data, such as number of cases, average age of participants and gender); indication for use; domains of frailty assessed (indicated by the author). Data related to the tool itself was also extracted, such as the recommended target population; mode of application; number of dimensions (indicated by the author); number of items; scoring/scoring classification; completion time, and resources required for application. The data extracted was presented in tables.

Verification of the tools developed for use in the cardiovascular care of older adults

Each of the tools included in the review was analyzed as to whether it had been developed for use in the cardiovascular care of older adults, regardless of the level of care complexity. To be considered a tool developed and proposed for use in older adults with heart disease, the tool should: 1) have its content covered by specificities of the patient with heart disease and/or 2) the development sample (study population) should specifically include patients with heart disease. The tool that met criteria 1 and/or 2 was classified as being specific for the multidimensional assessment of frailty in older adults with heart disease.

Verification of the validation of tools for use in the Nursing Process and their potential for use in cardiovascular care

In this last stage, all the tools were analyzed regarding their validation for use in the NP and their potential for adaptation for use in the NP. The tools considered validated for use in the NP were those that used nursing records as a method of development, in addition to other data sources and those for which the authors of the study stated that it was specifically for use by nurses. The tools considered to have validation potential for use in NP were those in which the frailty indicators and their respective investigation methods are accessible to nurses during the comprehensive nursing assessment, independently of other professionals.

All the tools included in the review were then analyzed for their potential applicability in the cardiovascular care of older adults at different levels of care complexity (primary care, hospitalization, emergency services and intensive therapy). The qualitative analysis considered the following feasibility indicators: specificity of the tool (target population and application scenario for which it was developed), the type of tool (subjective, objective or mixed), the type of respondent needed (patient or informant), the number of items, the implication of the number of items on application time and the applicability of the indicators in clinical nursing practice. Each tool was classified in a color-coded format as follows: 🟢 Green - Applicable, as demonstrated in the validation study; 🟡 Yellow – Requires adaptation and validation; 🔴 Possibly not feasible; ⚫ Not suitable because it is specific to another target population/scenario.

How the data was analyzed

The data was analyzed using a qualitative synthesis consisting of a simple descriptive analysis based on the data extracted, presenting measures of frequency, central tendency and data distribution when applicable. Rayyan software was used to operationalize the review.

RESULTS

A total of 2178 studies were retrieved from the eight databases investigated and 16 studies were added through a manual search. As a result, this review began with 2194 studies for analysis. Nineteen studies met the inclusion criteria and satisfied the minimum quality criteria and were included in this review. The following figure shows the flowchart for including the studies.
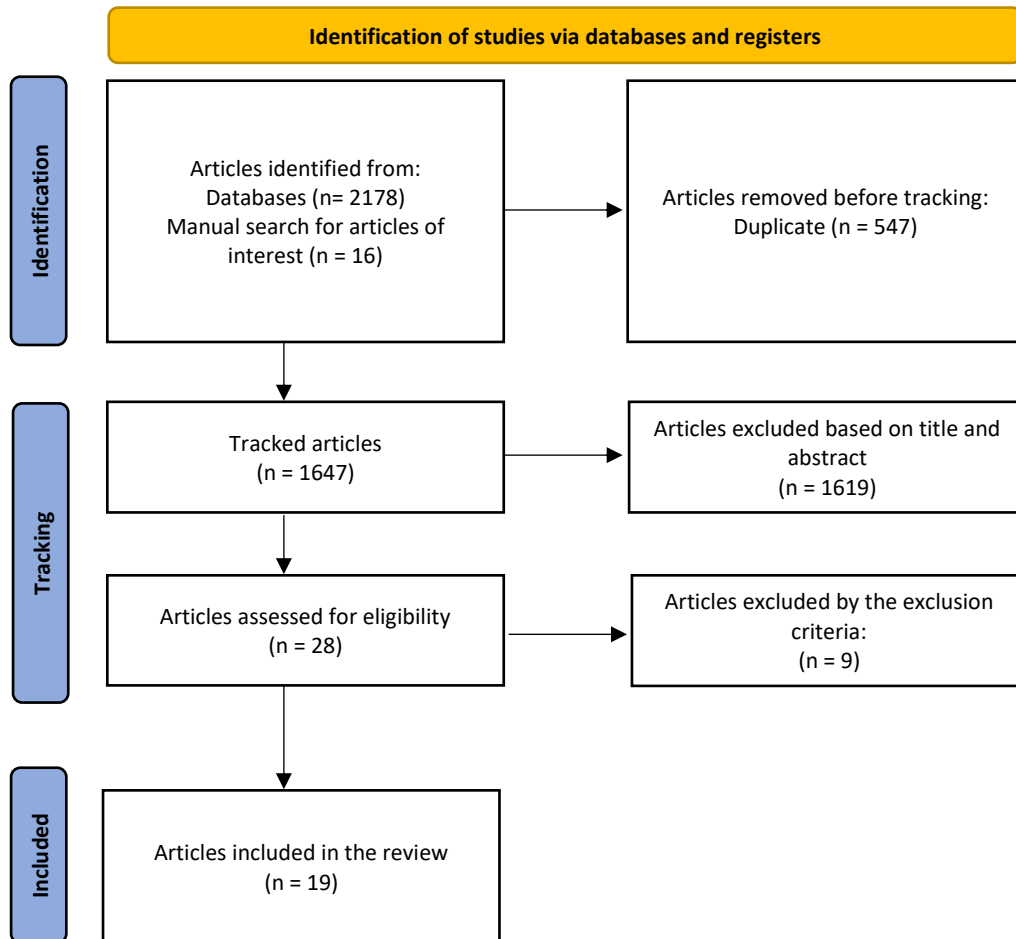

Figure 1: Flow diagram for inclusion of studies in the systematic review. Adapted from PRISMA, 2021[18]. São Paulo, SP, Brazil, 2024.

After including the 19 studies, 19 tools were identified: Clinical Global Impression of Change - Frailty Index (CGIC-FI)[13]; Frailty Index - Comprehensive Geriatric Assessment (FI-CGA)[14]; Edmonton Frailty Scale (EFS) [15]; Brief Frailty Index for Coronary Artery Disease (BrFI-CAD) [16]; British Frailty Index (BFI) [17]; Tilburg Frailty Indicator (TFI) [18]; Comprehensive Frailty Assessment Intrument (CFAI) [19]; Easycare Two-step older persons screening (Easycare-TOS) [20]; Groningen Frailty Indicator (GFI) [21]; Postal Screening Questionnaire to intercept Frailty (PSQ Inter-frail) [22]; Frailty Index for Adults (FIFE) [23]; Frailty Risk Index (FRI) [24]; Maastricht Frailty Screening Tool for Hospitalized Patients (MFST-HP) [25]; Emergency General Surgery specific frailty index (EGSFI) [26]; Frailty Groupe Iso-Resource Evaluation (FRAGIRE) [27]; Frailty Screening at an emergency department - FRESH-screening (FRESH) [28]; Total Kihon Checklist Score (KCL) [29]; Longitudinal Aging Study Amsterdam - Frailty Index (LASA-FI) [30]; Claims based frailty index (CFI) [31]. From this point on, the tools will be referred to by their acronym.

It was found that most of the tools were developed in countries in Europe (10 tools) and North America (7 tools). English was the original language of nine of the tools and only four of them were adapted into the Portuguese language spoken in Brazil. The tools were based on cross-sectional epidemiological studies (52.6%), cohort studies (42.1%) and Randomized Clinical Trials (10.5%). In 36.8% of cases, the samples came from epidemiological studies such as: 3CS, BWHHS and LASA, among others. The average age of the participants included in the studies ($N_{min-max} = 10 - 33,629$) ranged from 65.0 to 82.7 years and all the samples were represented by men and women. Figures 2 and 3 show the characteristics of the multidimensional frailty assessment tools reported by the studies included in the review.

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Figure 2: Summary table of the epidemiological characterization of the psychometric studies from 2004 to 2014 included in the review. São Paulo, SP, Brazil, 2024.

Author, Year	Country of origin	Tool acronym	Tool language (*)	Target population	Type of assessment to obtain data	Source of information	Domains of Frailty	Number of items	Final score
Studenski et al, 2004 [13]	USA	CGIC-FI	English	Community and institutionalized older adults	Subjective, by Clinical Interview	Respondent (patient)	BPS	15	0-15
Jones et al, 2004 [14]	Canada	FI-CGA	English	Outpatient older adults	Mixed, by Clinical Interview + Data extraction	Respondent (patient and informant) + Medical records	BPS	38	Improvement or worsening classified into 7 levels
Rolfson et al, 2006 [15]	Canada	EFS	English	older adul tsin the rural community, in primary care	Mixed, by Data extraction	Medical records; CGA data (collected from the patient and informant)	BPS	11	Mild (0-7), Moderate (8-13) and Severe (>13)
Freiheit et al, 2010 [16]	Canada	BrFI-CAD	English*	Outpatient older adults, inpatients, in a day hospital or in a rehabilitation unit	Mixed, by Clinical Interview	Respondent (patient)	BPS	11	0-17
Kamaruzzm an et al, 2010 [17]	United Kingdom	BFI	English	Older adults with CAD undergoing MR, ATC, or clinical treatment	Mixed, by Clinical Interview	Respondent (patient)	BPS	5	0-5
Gobbens et al, 2010 [18]	Netherlands	TFI	Dutch	Older adultsin the community, in primary care	Mixed, by Data extraction	Medical records; CGA data (collected from the patient)	BP	35	0-35
De Witte et al, 2013 [19]	Belgium	CFAI	German*	Older adults in the community, in primary care	Subjective, by Clinical Interview	Respondent (patient)	BPS	15	0-15
Van Kempen et al, 2013 [20]	Netherlands	Easycare-TOS	English	Older adults in the community, in primary care	Subjective, by self-application	Respondent (patient)	BPS	23	19-97
Peters et al, 2013 [21]	Netherlands	GFI	Dutch	Older adults in the community, in primary care	Subjective, by Clinical Interview	Respondent (patient)	BPS	14	0-51
Di Bari et al, 2014 [22]	Italy	PSQ Inter-Frail	Dutch	Older adults in the community, in primary care; elderly people in LSIE or home care	Subjective, by self-application	Respondent (patient)	BS	10	0-10
Tocchi et al, 2014 [23]	USA	FIFE	Italian	Older adults in the community, in primary care and institutionalized	Subjective, by Extracting data from the NP	Respondent (patient)	BP	10	0-10
Ng et al, 2014 [24]	Singapore	FRI	English	Older adults in the community, in primary care; elderly people in LSIE or home care	Mixed, by Clinical Interview	Respondent (patient)	BPS	13	0-13

Notes: *in the development sample; CAD=Coronary Artery Disease; MR=Myocardial revascularization; ATC=Transcutaneous Angioplasty; CGA=Comprehensive Geriatric Assessment; NP=Nursing Process; BPS=Biological, psychological, social.

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Figure 3: Summary table of the epidemiological characterization of the psychometric studies from 2016 to 2018 included in the review. São Paulo, SP, Brazil, 2024.

Author, Year	Country of origin	Tool acronym	Tool language (*)	Target population	Type of assessment to obtain data	Source of information	Domains of Frailty	Number of items	Final score
Warnier et al, 2016 [25]	Netherlands	MFST-HP	English	Hospitalized older adults admitted to cardiac/orthopedic surgery wards or medical clinic wards	Subjective, by Clinical Interview	Respondent (patient and informant)	BPS	15	0-15
Jokar et al, 2016 [26]	USA	EGSFI	German	Post-operative older adults admitted to an acute surgical care unit (Level 1 Trauma Center)	Subjective, by Clinical Interview	Respondent (patient and informant)	BP	15	0-1
Vernerey et al, 2016 [27]	France	FRAGIRE	French	Older adults in the community requiring home care	Mixed, by Clinical Interview	Respondent (patient)	BPS	16	0-100
Kajsa et al, 2016 [28]	Sweden	FRESH	Swedish	Older adults admitted to the emergency service who did not require immediate care for severe acute illness and palliative care	Subjective, by Clinical Interview	Respondent (patient)	BP	5	0-5
Satake et al, 2017 [29]	Japan	KCL	Japanese	Older adults in the community, in primary care	Subjective, by Clinical Interview	Respondent (patient)	BPS	25	0-25
Hoogendijk et al, 2017 [30]	Netherlands	LASA-FI	German	Older adults in the community, in primary care	Mixed, by Clinical Interview	Respondent (patient)	BP	32	0-1
Kim et al, 2018 [31]	USA	CFI	English	Older adults in the community, in primary care	Subjective, by Clinical Interview data	Medical record/CGA (health insurance provider data)	BPS	56	0-1

Notes: *in the development sample; CGA=Comprehensive Geriatric Assessment; BPS=Biological, psychological, social.

All the tools assessed the phenomenon of 'frailty'; in 63.2% of the studies, an association was established with clinical outcomes such as dependency (present in 36.8% of the studies) and mortality (present in 31.6%). Of the 19 tools included in the analysis, 84.2% (n=16) aimed to detect frailty. Only two tools were developed to classify the intensity of the phenomenon. The CGIC-FI is a tool that differs from all the others because it aims to monitor the improvement or worsening of the frailty state based on the clinical impression of the assessor.

It was found that most of the tools were developed from development and/or validation samples obtained from the community. One study used older adults from a rural community to develop the tool (MGAT). Of the 5 studies that used hospitalized older adults to validate the tools, 3 (60%) were for surgical patients. Regarding the other characteristics of the tools, it stands out that 57.9% (n=11) were subjective assessment tools and 42.1% (n=8) were mixed (included objective test data in the assessment).

The clinical interview format (using questionnaires) was the most commonly used mode of application (n= 13; 68.5%) and 10.5% of the tools were developed to be self-administered. Respondents were the most frequently reported source of information in the studies, being the patients themselves (n=14; 73.7%) most of the time or their informants when necessary (n=4; 21.0%).

In cases where data was extracted from medical records, two of the studies used data from the Nursing Process to complete the tool (FIFE and MSTF-FI); they were developed to support the assessment of Frailty Syndrome during the Nursing Process. One study used data from health insurance companies since the tool was built based on reimbursement data sent to the health insurance company.

Regarding the dimensions of the tools, which were theoretically established when the data was analyzed, it was found that most of them were designed to include three dimensions (n= 13; 68.4%). Among the tools with two dimensions, the biological dimension was represented 100% of the time, while the psychological dimension was covered 26.3% of the time, followed by the social dimension, which was present in 5.3% of the tools with two dimensions. The number of items per tool ranged from 5 to 56. The three indicators most used in the tools to compose the items were: Mood/affection (9.9%), Nutrition (7.9%), and Cognition (7.3%). The scores on the tools ranged from 0 to 100 points. Nine studies established cut-off points for outcomes. The average cut-off point was approximately 3 points (2.9±1.9 points, exactly), ranging from 0.25 to 5.0 points, excluding one of the tools (FRAGIRE) with a score ranging from 0-100 points and the cut-off set at 49.5 points (which would represent approximately 5.0 points if the score ranged from 0 to 10 points). In any case, 37.5% of the tools indicated the presence of frailty when the score was 4.0 points.

Most of the tools were developed for use in primary care (n=14; 73.3%). Of these, three tools were also developed to be applied to patients in home care and two in long-term care institutions. One tool (EFS) was developed to be used in primary care as well as in hospitals and rehabilitation units. Five tools (26.3%) were developed to be applied to hospitalized patients. Only four studies reported the time required to apply the tools. Of those that did, the time taken to complete the questionnaire ranged from one to 30 minutes. The median minimum application time was 6.5 minutes and the median maximum application time was 12.5 minutes (excluding the second Easycare-TOS evaluation).

It was observed that only one tool was specifically developed for use in the cardiovascular care of the older adults, the BrFI-CAD, developed to assess frailty in older adults with Coronary Artery Disease (CAD) undergoing Myocardial Revascularization (MR), Transcutaneous Angioplasty (*Angioplastia Transcutânea*, ATC) or clinical treatment.

Figure 4 presents the multidimensional frailty assessment instruments and the feasibility of incorporating them into clinical nursing practice aimed at cardiovascular care for the elderly, according to the complexity of care.

Although only one tool was specifically developed for the multidimensional frailty assessment of older adults with heart disease, it was observed that several tools have potential applicability for the cardiovascular care of older adults.

With the exception of the two tools that were developed to support the nursing process, 15 were classified as having great potential to be validated for use in NP. All the tools analyzed can be adapted and validated for use in the cardiovascular care of Brazilian older adults at different levels of care complexity: 03 tools can be adapted for use in primary care; 13 for use in hospital inpatient units (clinical or surgical); 05 for use in emergency services and 09 for use in intensive care units.

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Figure 4: Feasibility of multidimensional frailty assessment tools for incorporation into clinical nursing practice aimed at the cardiovascular care of older adults, according to the complexity of care. São Paulo, SP, Brazil, 2024.

Tool	Validation for use in the NP?	Adaptable for NP?	Potential applicability in cardiovascular care for elderly people...			
			... in primary care	... during hospitalization#	... in emergency	... in intensive care
CGIC-FI	No	Yes	🟢	🟡	🔴	🔴
FI-CGA	No	Yes	🟢	🟡	🟡	🟡
EFS*	No	Yes	🟢	🟢	🔴	🟡
BrFI-CAD	No	Yes	🟡	🟢	🟡	🟡
BFI	No	Yes	🟢	🟡	🔴	🔴
TFI*	No	Yes	🟢	🟡	🔴	🔴
CFAI	No	Yes	🟢	🟡	🔴	🔴
Easycare-TOS	No	Yes	🟢	🟡	🔴	🔴
GFI*	No	Yes	🟢	🟡	🔴	🟡
PSQ Inter-frail	No	Yes	🟢	🟡	🟡	🟡
FIFE	Yes	-	🟢	🟡	🟡	🟡
FRI	No	No	🟢	🟡	🔴	🟡
MFST-HP	Yes	-	🟡	🟢	🔴	🟡
EGSFI	No	Yes	🟡	🟢	🟡	🟢
FRAGIRE	No	Yes	🟢	🟡	🔴	🔴
FRESH	No	Yes	⚫	⚫	🟢	🟡
KCL*	No	Yes	🟢	🟡	🔴	🔴
LASA-FI	No	Yes	🟢	🟡	🔴	🔴
CFI	No	No	🔴	🔴	🔴	🔴

🟢 Applicable; 🟡 Requires adaptation and validation; 🔴 Possibly unfeasible; ⚫ Not suitable # for clinical or surgical conditions *Brazilian version available.

DISCUSSION

Assessment of frailty is necessary and depends on assessment tools. There are numerous tools available for assessing frailty [6-7]. Several of them are variations of a frailty index. Many studies report a frailty index created for the study itself, making it extremely difficult to differentiate between the indices and recognize them.

In this review, numerous tools were analyzed, and most of them were not included because they were one-dimensional. Frailty indexes derived from other indexes are the main example of one-dimensional tools. Almost all of them only included the biological dimension, which is certainly due to the theoretical model used to build the tool.

At this point, the importance of the conceptual definition of the phenomenon for the construction of a measuring tool becomes clear. Regarding frailty, there seems to be no consensus on this definition, since the tools are based on different models of frailty. The controversy over the definition, both conceptually and operationally, can be translated in many ways: 1) there is a large number of similar tools that seek to measure a construct called 'frailty'; 2) there is a huge variation in the incidence and prevalence rates of frailty between studies and this may be due to the problems with the conceptual and operational definition of the phenomenon and 3) it is observed that the measures of frequency and effect are inconsistent between studies, since the measure used to measure the determinants of the outcome and the outcomes themselves is noisy.

The definition of 'state of frailty' that seems most appropriate was proposed by Gobbens et al. in 2010 and states that "*frailty is a dynamic state that affects an individual who presents losses in one or more domains of human functioning (physical, psychological and social), being caused by the influence of a variety of conditions and which increases the risk of adverse outcomes*"[18].

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This concept represents a major improvement on the classic concept, which can still be improved. Based on this concept, it can be understood that frailty is a multidimensional geriatric syndrome, characterized by a clinically manifest dynamic state of increased vulnerability to intrinsic and extrinsic stressors, resulting from a multisystemic organic decline caused by a decrease in the organic functional reserve and the capacity to tolerate biological, psychological and social stressors. The extent to which this understanding effectively represents the phenomenon of frailty needs to be investigated and a psychometric content validation study can be carried out for this purpose.

Many authors have stated that the operational definition of frailty is 'fragile'. This is the argument used to justify the development of new tools for the same purpose. In the end, more than fifty frailty assessment tools are available. And many more will be created with the same justification as long as the conceptual definition of the phenomenon is not clearly established.

Of the nineteen tools analyzed, only one was developed to assess frailty in older adults with cardiovascular disease, more specifically in older adults with coronary artery disease. None of the others were developed for use in the cardiovascular care of older adults, but almost all of them have the potential to be adapted and validated for this purpose and then incorporated into this context of use. This is what is recommended. Instead of creating more frailty assessment tools, it is recommended that those available be refined for use in the cardiovascular care of older adults, since all of the nineteen tools identified have little or almost no evidence of validity and reliability, as verified in the analysis phase of the methodological quality of the studies.

Study limitations

This review sought to identify which multidimensional frailty assessment tools are aimed at assessing older adults with cardiovascular disease and have the potential to be applied in NP, however, no analysis was made of their psychometric quality, which could be considered a study limitation. It is recommended that a psychometric synthesis of each of the tools be drawn up, based on a contemporary psychometric theoretical framework[11,12].

Although this study is not intended to recommend the use of one or more frailty tools in the cardiovascular care of older adults, whether or not they are linked to NP, it serves as a basis for checking which tools have the potential to serve this purpose, if properly adapted. Given the vast number of tools available, the results presented direct nurses to the possibilities that exist.

The use of tools to assess the state of frailty can help detect and/or classify the phenomenon, minimizing the occurrence of adverse events resulting from care based on a poor or mistaken assessment. Therefore, its use is relevant and essential to support the cardiovascular care of older adults in nursing practice.

CONCLUSION

A total of 19 multidimensional frailty assessment tools were identified. Only one was developed to support assessment in the cardiovascular care of older adults, and two were developed for use in the Nursing Process. Almost all of the tools analyzed have the potential to be adapted and validated for use in the cardiovascular care of older adults and therefore serve as a basis for the nursing process.

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Review Article
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