


BMJ Open Mapping instruments for assessing and stratifying frailty among community-dwelling older people: a scoping review

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ABSTRACT

Objective To map in the current literature instruments for the assessment and stratification of frailty in community-dwelling older people, as well as to analyse them from the perspective of the Brazilian context.

Design Scoping review.

Study selection The selection of studies took place between March and April 2020. Includes electronic databases: Medline, Latin American and Caribbean Literature in Health Sciences, Scopus, Web of Science and Cumulative Index of Nursing and Literature Health Alliance, in addition to searching grey literature.

Data extraction A data extraction spreadsheet was created to collect the main information from the studies involved, from the title to the type of assessment and stratification of frailty.

Results In summary, 17 frailty assessment and stratification instruments applicable to community-dwelling older people were identified. Among these, the frailty phenotype of Fried *et al* was the instrument most present in the studies (45.5%). The physical domain was present in all the instruments analysed, while the social, psychological and environmental domains were present in only 10 instruments.

Conclusions This review serves as a guideline for primary healthcare professionals, showing 17 instruments applicable to the context of the community-dwelling older people, pointing out advantages and disadvantages that influence the decision of the instrument to be used. Furthermore, this scoping review was a guide for further studies carried out by the same authors, which aim to compare instruments.

INTRODUCTION

Assessing and managing the health of the older people have been presented as a strong goal of health professionals in the field of geriatrics and gerontology.¹ The Ministry of Health of Brazil recommends the systematic evaluation of this public, including in PHC,² since with the demographic transition that has been occurring all over the world, older people are becoming increasingly long lived and this is a factor that is also associated with

Strengths and limitations of this study

- This is the first scoping review in the literature to analyse the instruments available for screening and stratifying frail older adults in the community, which will serve as a guide for Primary Healthcare (PHC) professionals during the assessment of the older adults.
- The research strategy includes five electronic databases with peer-reviewed literature, as well as a wide variety of sources of grey literature.
- A limitation of the study is the search for studies with only an observational design. It involves research using instruments, questionnaires, interviews, which most resembles the reality of PHC workers. Clinical research with a greater degree of methodological robustness and assessment equipment/instruments are not feasible to be developed in the context of PHC.

the emergence of health problems, such as frailty.³

Frailty is a clinical condition in which there is a decrease in biological reserve and resistance to stressors, resulting from changes in various physiological systems, leading to the individual's vulnerability⁴ and other adverse health outcomes, such as risk of falls, disability, hospitalisation and mortality.^{5 6} To date, there is still no consensus on a single definition of frailty for clinical use⁶ since such impairment can be either physical, psychological or a combination of both.⁷ As a result, several concepts and ways of measuring the syndrome are available in the literature,^{5 8–10} which often makes it difficult to make comparisons and choose the one that best fits the epidemiological reality of each region.

The prevalence of frailty varies greatly according to the context of analysis and the assessment instrument that is used.¹¹ Studies carried out in Brazil found that the prevalence of frailty in the older people varied between 8.7% and 47.2%.^{12 13} There is still no



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consensus on which instrument should be used to identify and stratify frailty in the older people, since many instruments only consider the physical aspects of the condition, others take into account psychological and cognitive issues.¹¹ Such divergence makes it even more difficult to identify this condition early, especially in PHC, since in this context, the use of instruments of low technological complexity and low cost is indicated.¹⁴

In this perspective, it is necessary to investigate simpler instruments for the identification of frailty, facilitating its use in care environments such as PHC,¹¹ since identification in the early stages allows a better prognosis of reversal of frailty.¹ This is the reason why low-cost, easy-access and applicable assessment tools for the screening and stratification of frailty are so important.

Thus, it is important to search the literature for instruments for screening and stratifying frailty in community-dwelling older people, in an attempt to guide PHC health professionals towards early identification, prevention and treatment of this public. Professionals trained in adequate numbers and with the necessary resources are essential aspects for effective care, as well as the identification and prevention of frailty in older people.³

Therefore, this scoping review aims to identify the instruments available in the literature for the assessment and stratification of frailty in community-dwelling older people, as well as analysing them from the perspective of the Brazilian context. With these data, health professionals and managers will have a guide containing the main instruments they can use in the search for early identification of frailty, as well as assisting in the action planning and decision-making in health regarding this topic. This paper will constitute the first stage of a larger research that aims to compare assessment instruments for the frailty among older people in the community.

METHODS

The scoping review methodological design was chosen as a research design, as it has methodological rigour and serves to map and analyse the scientific literature, with the additional advantage of including methodologically heterogeneous evidence, in addition to consulting stakeholders to validate this evidence.¹⁵

Identification of the research question

This topic was developed through research in the literature about 'frailty in the older adults in primary health care', along with discussions by the research team on the subject in question. In the pursuit for the research question, the Population, Concept and Context strategy was used, a methodology proposed by the Joanna Briggs institute,¹⁶ thus defined as: Population (older adults individuals aged 60 or over); Concept (frailty assessment instruments); Context (community/PHC) the following research question was defined: What are the instruments available in the literature for assessing and stratifying frailty in community-dwelling older people?

Some instruments for the assessment of the older adults are known to the scientific community^{12 17 18}; however, many of them, due to their complexity, were not developed to be applied in the context of PHC,^{5 19} that is, in community-dwelling older adults. Therefore, the mapping of this research aims only at instruments of low technological complexity that can be applied to the population inserted in this context.

Identifying relevant studies

This stage was based on meetings with the research team, which defined the planned approach: the eligibility criteria of the studies, the selected databases, as well as the research strategy with the respective descriptors.

Eligibility criteria: full articles published without restriction of language or date of publication were included, in which the primary or secondary objective was the assessment of frailty in community-dwelling older people using instruments. In this study, the older people will be considered to be an individual aged 60 or over.

Editorials, experience reports, review protocols, clinical trials, reflection studies and reviews were excluded; papers that do not present abstract and full text online. Studies addressing evaluations through laboratorial or higher technological clinical exams were excluded.

The identification of relevant studies was conducted by searching electronic databases of scientific literature such as: Medline, Latin American and Caribbean Literature in Health Sciences (LILACS), Scopus, Web of Science and Cumulative Index of Nursing and Literature Health Alliance (CINAHL). The choice of these databases was due to the wide coverage of studies both internationally and nationally, with public access or available through a library, in addition to the large collection of manuscripts related to the theme of ageing. The search strategy used in these databases was defined by the research team and collaborators and it is detailed in [table 1](#).

An analysis of all reference lists of the included studies was also carried out, in order to identify additional relevant studies. In addition, information was captured,

Table 1 Database search strategy

Search	Query
#1 Comparator	(frail OR frailty)
#2 Comparator	(aging OR elderly)
#3 Comparator	("independent living" OR "community dwelling")
#4 Comparator	("Observational Study")
#5 Limit	#1 AND #2 AND #3 AND #4 There was no restriction on language and date of publication, only the study design that was delimited by the choice of the comparator #4

researches were made on a variety of sources of grey literature, such as thesis and dissertation banks, annals of national and international congresses on geriatrics and gerontology and in the reference list of selected articles, to identify studies, reports and conference abstracts relevant to this review. For the analysis of grey literature, an extra researcher was invited (BSACNY). This researcher was informed about the research objectives and descriptors used, in order to do an independent search in the grey literature. Restrictions were not applied in relation to the period of publication of the studies in the analysed bases nor in relation to the language of the research.

Selection of studies

The selection of studies took place in two stages: first, there was a review of the title and abstract, after the elimination of duplicate articles, for this stage, the articles were added on the Rayyan platform (<https://rayyan.qcri.org>). The second stage consisted of reviewing the full text of the studies that were selected in the first stage. For both stages, the process took place in pairs, where two researchers (RSSAG and SGGF) duly trained and oriented about the eligibility criteria of the studies performed the screening in a blind and independent way and, in case of doubts or divergences in the selection, there was a third evaluator (LELA) who judged and resolved any selection problems encountered. The study selection period was from February to April 2020.

In the first stage, the two researchers (RSSAG and SGGF) independently selected the tracked studies based on the title and abstract. The eligibility criteria was tested on a sample of abstracts before the start of the abstract review to ensure that they were robust enough to capture any articles that may be related to instruments for assessing of frailty in community-dwelling older adults. Any articles that were considered relevant by one or both reviewers were included in the review of the full text.

In the second stage, the two researchers (RSSAG and SGGF) read the studies selected in the first stage in full to determine whether they met the inclusion and exclusion criteria. In order to determine the agreement between evaluators, as well as to support the rigour of the research.

Data collection

Data were collected using a semistructured form developed by the research team, which aims to collect relevant information from the studies included in this research. This form was previously tested by all reviewers before its final application, to ensure that the information captured was accurate.

Data collection was carried out in pairs, where two reviewers (RSSAG and SGGF) independently extracted data from all included studies. At the end, individual collections were compared in order to visualise possible discrepancies and, if there were any, they were reviewed and analysed by the research group, thus ensuring consistency among reviewers.

The questionnaire had items such as: year of publication, type of publication (eg, original research), country, study objective, population and sample, characteristics of the type of evaluation instrument used, number of items in the instrument, number of domains of the instrument, form of instrument assessment (interview, self-report, questionnaire), form of screening and/or stratification of frailty: descriptive, score (with appropriate cut-off points), percentiles.

The assessment instruments included were divided according to [table 2](#) into objectives, subjective and mixed. This was a didactic way to facilitate the understanding of instruments that use a questionnaire or interview (subjective evaluation), tools that use performance measures (objective evaluation) or both forms of evaluation (mixed). A quality assessment was not included in the mandate of this scope review. As this is a research with data secondary to published articles, there was no involvement of the patient and the public for data collection.

Patient and public involvement

No patient involved.

RESULTS

The search in the databases and grey literature resulted in a total of 2668 studies. After excluding duplicates, 1357 studies were evaluated by peers for eligibility in the title and abstract. After applying the inclusion and exclusion criteria, 72 articles were read in full and, of these, only 55 were selected for final analysis in this research ([figure 1](#)). The characteristics of the included studies are shown in [table 2](#).

A total of 141 115 older people comprised the sum of the samples of the included studies, the smallest study being composed of 26 participants, while the study with the largest sample recruited more than 72 000 participants. Regarding the gender of the participants, most studies used samples that involved both sexes (91%), with the exception of five studies that were composed of only women ([table 2](#)).

In general, 17 instruments for assessing and stratifying frailty applicable to community-dwelling older people were analysed, with Fried's frailty criteria being the most used instrument, being present in 25 studies (45.5%) ([table 2](#)). Of the 55 articles included, 39 were published after 2015 (71%), most were from American continents: South America (32.8%) or North America (21.9%), and the most used study design cross-sectional (47.3%) ([table 2](#)).

Although they have a similar purpose, which is the assessment of frailty, the instruments had very heterogeneous structures, such as the number of items, where the instrument with the lowest quantity had three items (Study of Osteoporotic Fractures-Frailty Index (SOF-FI) and the highest quantity had 36 items (FI), in addition to an instrument that did not specify the number of items as it was a broad and robust assessment (Comprehensive

Table 2 Details of the studies included according to the author, study design, sample size, instrument for assessing frailty and the prevalence of frailty in the older people.

Author (year)	Study design	Sample size	Frailty assessment tool
Maltais <i>et al</i> ⁴¹ 2019	Prospective cohort	113 older people of both sexes (≥70 years)	Phenotype of frailty
Serra-Prat <i>et al</i> ⁴² 2019	Cross-sectional	324 older people of both sexes (≥75 years)	Phenotype of frailty
Tamaki <i>et al</i> ⁴³ 2018	Cross-sectional	800 older people of both sexes (≥65 years)	KC e Phenotype of frailty
Iizaka ⁴⁴ 2018	Cross-sectional	128 older people of both sexes (≥65 years)	Phenotype of frailty
Li <i>et al</i> ⁴⁵ 2018	Prospective cohort	2438 older people of both sexes (≥65 years)	Modified Phenotype of frailty
Zylbergait Lisiguerski <i>et al</i> ⁴⁶ 2018	Prospective cohort	291 older people of both sexes (≥65 years)	5-item FRAIL
Shimada <i>et al</i> ²⁰ 2019	Cross-sectional	4072 older people of both sexes (≥65 years)	Phenotype of frailty; NCGG-FAT
Sampaio <i>et al</i> ⁴⁷ 2015	Cross-sectional	211 older people women (≥60 years)	KC
Garre-Olmo <i>et al</i> ⁴⁸ 2013	Prospective cohort	875 older people of both sexes (≥74 years)	Disability-free frailty phenotype
Wang <i>et al</i> ⁴⁹ 2010	Prospective cohort	635 older people women aged between 70–79 years	Phenotype of frailty
Crow <i>et al</i> ⁵⁰ 2019	Cross-sectional	4984 older people of both sexes (≥60 years)	Phenotype of frailty
Hasegawa <i>et al</i> ⁵¹ 2019	Cross-sectional	308 older people of both sexes (≥65 years)	KC
Satake <i>et al</i> ⁵² 2017	Prospective cohort	5542 older people of both sexes (≥65 years)	KC
Ballew <i>et al</i> ⁵³ 2017	Cross-sectional	341 older people of both sexes (≥66 years)	Phenotype of frailty
Zaslavsky <i>et al</i> ⁵⁴ 2017	Prospective cohort	876 older people women (≥65 years)	Phenotype of frailty
Monin <i>et al</i> ⁵⁵ 2016	Prospective cohort	2524 older people of both sexes (≥65 years)	Phenotype of frailty
Espinoza and Hazuda ⁵⁶ 2015	Cross-sectional	394 older people of both sexes (65–80 years)	Phenotype of frailty
Drubbel <i>et al</i> ⁵⁷ 2013	Cross-sectional	1549 older people of both sexes (≥60 years)	GFI e FI
Yao <i>et al</i> ⁵⁸ 2011	Prospective cohort	94 older people of both sexes (≥70 years)	Phenotype of frailty
Kiely <i>et al</i> ⁵⁹ 2009	Prospective cohort	765 older people of both sexes (≥70 years)	Phenotype of frailty; SOF-Frailty Index
Chaves <i>et al</i> ⁶⁰ 2008	Cross-sectional	389 older people women (≥65 years)	Phenotype of frailty
Ožić <i>et al</i> ⁶¹ 2020	Prospective cohort	410 older people of both sexes (75–95 years)	TFI
Potier <i>et al</i> ⁶² 2018	Prospective cohort	82 older people of both sexes (≥70 years)	Phenotype of frailty
Belisário <i>et al</i> ⁶³ 2018	Cross-sectional	705 older people of both sexes (≥60 years)	Phenotype of frailty
Sousa-Santos <i>et al</i> ³⁷ 2018	Cross-sectional	1457 older people of both sexes (≥65 years)	pPhenotype of frailty
Hoeksema <i>et al</i> ⁶⁴ 2017	Cross-sectional	1325 older people of both sexes (≥75 years)	GFI
Turusheva <i>et al</i> ⁶⁵ 2016	Prospective cohort	611 older people of both sexes (≥65 years)	Cumulative model (Puts model); Steventik-Slaets model (using the GFI); Phenotype of frailty
Bastone <i>et al</i> ⁶⁶ 2015	Cross-sectional	26 older people of both sexes (≥65 years)	Phenotype of frailty
Ruiz-Arregui <i>et al</i> ⁶⁷ 2013	Prospective cohort	1124 older people of both sexes (≥70 years)	Phenotype of frailty
Giudici <i>et al</i> ⁶⁸ 2019	Prospective cohort	1679 older people of both sexes (≥70 years)	Phenotype of frailty
Lin <i>et al</i> ³³ 2018	Prospective cohort	72127 older people of both sexes (≥65 years)	KC
Yeap <i>et al</i> ³⁴ 2012	Prospective cohort	3447 older people men aged between 70 and 89 years	FRAIL Scale.
Xue <i>et al</i> ⁶⁹ 2008	Prospective cohort	420 older people women aged between 70–79 years	Phenotype of frailty
Min <i>et al</i> ⁷⁰ 2006	Prospective cohort	3207 older people of both sexes (≥65 years)	VES-13
Pegorari <i>et al</i> ⁷¹ 2013	Cross-sectional	51 older people of both sexes (≥65 years)	Phenotype of frailty
McHugh <i>et al</i> ²⁸ 2016	Prospective cohort	624 older people of both sexes (≥65 years)	Modified frailty phenotype
Tian <i>et al</i> ⁷² 2018	Cross-sectional	1917 older people of both sexes (≥60 years)	Phenotype of frailty
Freitas and Soares ⁷³ 2019	Cross-sectional	2972 older people of both sexes (≥65 years)	CFVI-20
Fhon ⁷⁴ 2011	Cross-sectional	240 older people of both sexes (≥60 years)	EFS

Continued

Table 2 Continued

Author (year)	Study design	Sample size	Frailty assessment tool
Ribeiro ⁷⁵ 2018	Methodological study	396 older people of both sexes (≥60 years)	CFVI-20 e EFS
Ribeiro <i>et al</i> ⁷⁶ 2018	Retrospective cohort	311 older people of both sexes (≥60 years)	CFVI-20 e EFS
Moraes <i>et al</i> ²¹ 2016	Cross-sectional	397 older people of both sexes (≥60 years)	CFVI-20 e CGA
Ribeiro <i>et al</i> ⁷⁷ 2019	Retrospective cohort	950 older people of both sexes (≥60 years)	CFVI-20
Marques ⁷⁸ 2019	Cross-sectional	72 older people of both sexes (≥60 years)	TFI
Fabricao-Wehbe <i>et al</i> ⁷⁹ 2016	Prospective cohort	723 older people of both sexes (≥60 years)	EFS
Santiago ⁸⁰ 2013	Cross-sectional	219 older people of both sexes (≥60 years)	TFI and the brazilian version of TFI
Faller ²⁹ 2019	Cross-sectional	555 older people of both sexes (≥60 years)	Modified frailty phenotype e CFVI-20
Neto ⁸¹ 2019	Cross-sectional	196 older people of both sexes (≥60 years)	VES-13
Balbinot and Uscocovich ⁸² 2019	Prospective cohort	403 older people of both sexes (≥60 years)	VES-13
Maia ³⁶ 2011	Prospective cohort	2143 older people of both sexes (≥60 years)	VES-13
Barbosa ⁸³ 2015	Cross-sectional	368 older people of both sexes (≥60 years)	VES-13 e Social Vulnerability Index
Lang <i>et al</i> ⁸⁴ 2009	Cross-sectional	4818 older people of both sexes (≥65 years)	FI
Daniels <i>et al</i> ⁸⁵ 2012	Prospective cohort	430 older people of both sexes (≥70 years)	GFI; Dutch TFI; SPQ
Fukutomi <i>et al</i> ⁸⁶ 2015	Prospective cohort	883 older people of both sexes (≥65 years)	KC
Yamaguchi <i>et al</i> ⁸⁷ 2018	Cross-sectional	8174 older people of both sexes (≥65 years)	KC

CFVI-20, Functional Clinical Vulnerability Index-20; CGA, Comprehensive Geriatric Assessment; EFS, Edmonton Frailty Scale; FI, Frailty Index; GFI, Groningen Frailty Indicator; KC, Kihon Check list; NCGG-FAT, National Center for Geriatrics and Gerontology-Functional Assessment Tool; SOF-Frailty Index, Frailty Index of Study of Osteoporotic Fractures; SPQ, Sherbrooke Postal Questionnaire; TFI, Tilburg Frailty Indicator; VES-13, Vulnerable Elders Survey.

Geriatric Assessment (CGA)). Regarding the evaluation time, only two studies reported these times, one being,²⁰ which reported only the time for evaluating the cognitive part (20 min), and another,²¹ reported that the evaluation of one of the addressed instruments varied between 60 and 90 min.

Regarding the domains, six instruments evaluate only physical questions (Phenotype of frailty, Modified Frailty Phenotype, 5-Frail, SOF-FI, Vulnerable Elders Survey (VES-13) and Frail Scale), one evaluates physical and cognitive questions (National Center for Geriatrics and Gerontology-Functional Assessment Tool (NCGG-FAT)), four evaluate physical, psychological and social issues (disability-free frailty phenotype, Groningen Frailty Indicator (GFI), Tilburg Frailty Indicator (TFI) and Sherbrooke Postal Questionnaire (SPQ)), the other instruments have more than three domains for assessing frailty. Of the 17 instruments analysed, two have the ability to predict mortality in the next 2 years (VES-13 and CGA) and six have the ability to predict prefrailty (Phenotype of Frailty, Modified Frailty Phenotype, 5-Frail, SOF-FI, FI, Puts Model and CGA). Of these instruments, 10 are validated in Brazil, and one (Clinical-Functional Vulnerability Index-20 (CFVI-20)) was developed in the country.

The prevalence of frailty was heterogeneous, varying from 3% to 52.7% between studies, this variation occurred both between different instruments, and even between the same instruments used in different studies (table 3).

DISCUSSION

This study used a systematic approach to map and synthesise the main instruments for screening and stratifying frailty in community-dwelling older people, in addition to analysing them from the perspective of the Brazilian context. The assessment of frailty is becoming a routine daily practice in the treatment of older people patients,²² so a guide with the tools that can trace such screening and stratification in the context of PHC is of paramount importance.

In summary, 55 articles became eligible for the study, with 17 different instruments present. The phenotype of frailty⁵ was the most used instrument in the articles, which also demonstrates a strong connection of the physical domain in the assessment of frailty in older people.

In the analysed articles, the physical domain was present in all instruments, while the other domains (social, psychological and environmental) were present in more recent instruments (Edmonton Frailty Scale (EFS), Disability-free frailty phenotype, GFI, CFVI-20, Kihon Check list (KC), NCGG-FAT, TFI, Puts model and SPQ). This may be related to the evolution of the concept of frailty, which in its early days was related strictly to physical issues⁵ and today, this concept involves multifactorial and systemic issues.¹¹

Researches show that frailty is directly associated with factors other than physical functions, such as social, environmental and psychological.²³⁻²⁵ A study developed by

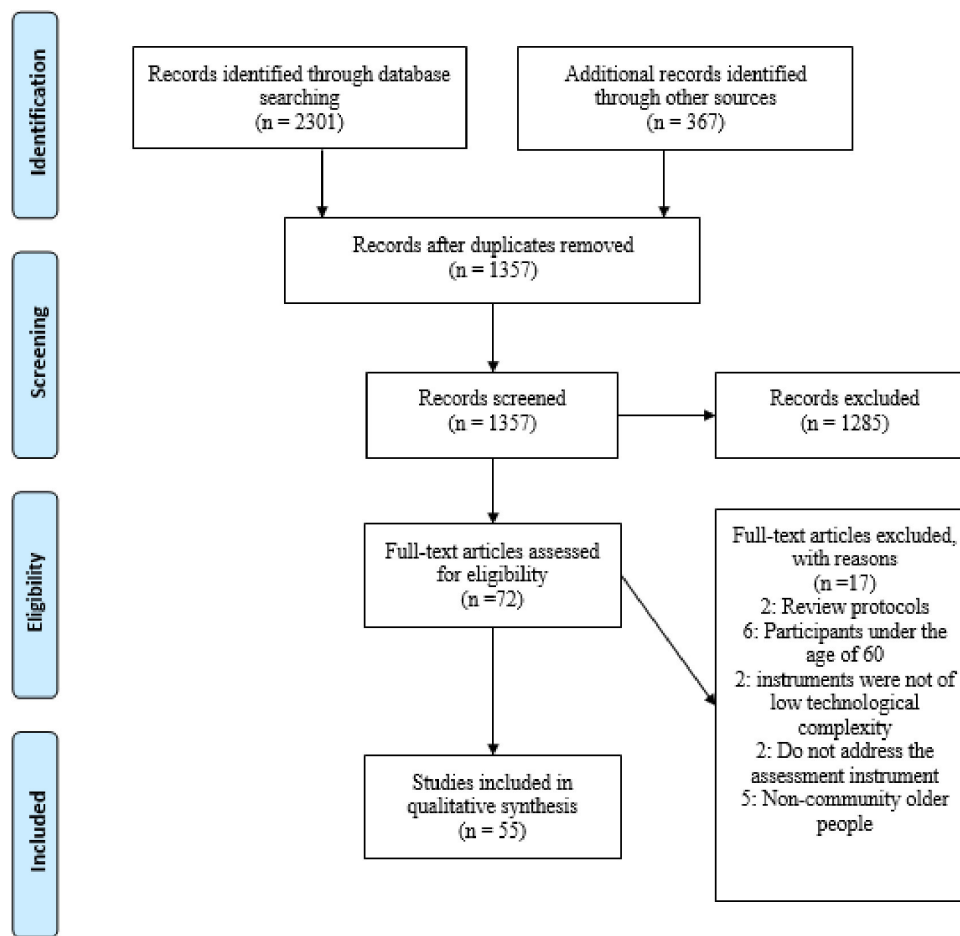


Figure 1 Selection diagram of studies involving instruments for screening and stratifying frailty in the older people.

Santiago *et al.*²⁶ using the TFI, assessed 442 older people men and women and concluded that, if only the physical domain was considered, 0.3% of the sample would have frailty, when the social domain was added, the prevalence would increase to 2.9% and when analysing the three domains (physical, social and psychological), the prevalence would rise to 52%. This reinforces the idea that frailty can arise not only from strictly physical issues,²¹ directly affecting the choice of the assessment instrument, since some assess only the physical domain.

Among the instruments analysed, there was a heterogeneous and multifaceted structure, this diversity provided methodological divergences both in the choice of the instrument, in the definition of the cut-off point for exposure to frailty, as well as in its prevalence among the samples, which compromise the comparison of studies.²⁷ The survey carried out in this review found that there is still no gold standard tool for assessing frailty, the ones found in the papers are instruments that use diversified parameters. Even so, each instrument has advantages and disadvantages, therefore, it is highlighted that, for the proper choice of the instrument in the context of PHC, the focus should be on which type of screening is to be performed.

The assessment instruments were didactically categorised into objective, subjective and mixed. These forms

of assessment corroborate the understanding of authors such as Tibess and de Oliveira,²⁷ who point out that, for logistical reasons, questionnaires/interviews continue to be used frequently in older populations, although efforts have been made to increase the use of performance measures.

Some instruments such as phenotype of frailty and its modified version,^{5 28 29} for presenting an assessment of physical performance, require specific tools such as the manual dynamometer, while other instruments for presenting only subjective evaluation (through questionnaires or interviews) such as the CFVI-20 or VES-13 do not need more specific equipment. This can also influence the choice of the assessment instrument, since, in the context of PHC in the Brazilian reality, sometimes more specific devices are not available, and the assessment of frailty will be limited by tools that require such instruments.

Some questionnaires use questions about past times such as: 'In the last year, did you lose more than 5% of your body weight?', or about activities carried out in the previous week, self-perceived health issues based on past days (phenotype of frailty, Modified Frailty Phenotype, NCGG-FAT, KC, CFVI-20, CGA, EFS, disability-free frailty phenotype, Frail scale, FI, SOF, TFI and GFI), these questions are often influenced, in the older people population,

Table 3 Description of evaluation of frailty instruments (criteria evaluation and stratification)

Evaluation of frailty instrument	Type of evaluation	Components	Score and stratification	Validated in Brazil	Prevalence of frailty among studies (%)
5-item FRAIL	Subjective	5 sections (fatigue, resistance, ambulation, illnesses and loss of weight)	Score: 0–5; Stratification: 0: robust, 1–2: prefrail, ≥3: frail	No	16.8
Clinical-Functional Vulnerability Index-20	Subjective	20 items, 8 sections (age, health self-perception, functional disabilities, cognition, mood, mobility, communication and presence of multiple comorbidities).	Score: 0–40; Stratification: 0–6: robust, 7–14: at risk of frailty, ≥15: frail	Yes	12.60–21.79
Comprehensive Geriatric Assessment	Mixed	Global functionality, functional systems 'cognition, mood, mobility, and communication', major physiological systems, medication use, past history and contextual factors 'socio-family, environmental and caregiver assessment'	Score: none; Stratification: classifies the subject in one of the 10 clinical-functional strata ≥4: frail	Yes	–
Disability-free frailty phenotype	Subjective	Physical frailty 'chronic diseases, balance, nutrition, continence, vision, use of medicines, use of vasoactive drugs', mental frailty 'cognition, depression, cognitive self-concept, and quality of life', and social frailty 'living alone, lack of person to assist in activities of daily living, little contact with family, friends and neighbors, absence of a confidant, lack of support for activities for 3 months'	Score: none; Stratification: >4: physical frailty, >2: mental frailty, >2: social frailty	No	Physical frailty: 17.3 Mental frailty: 22.8 Social frailty: 6.8
Edmonton Frail Scale	Mixed (multidimensional)	11 items, 9 sections (cognition, general health state, functional independence, emotional support, medication use, nutrition, mood, continence, and functional performance)	Score: 0–17; Stratification: 0–4: no frailty, 5–6: apparently vulnerable, 7–8: mild frailty, 9–10: moderate frailty, >11: severe frailty	Yes	Mild frailty: 16.7–18.3 Moderate frailty: 6–11.3 Severe frailty: 1.5–9.6
FRAIL Scale	Subjective	5 items (fatigue, resistance 'ability to climb up one flight of stairs', ambulation 'ability to walk one block', illness '>5 comorbidities', and loss of weight '>5%')	Score: 0–5; Stratification: 0: robust, 1–2: prefrail, >3: frail	No	15.3
Frailty Index	Subjective	36 items (selected from the ICP-C-coded, includes symptoms, diseases, functional impairments and social problems).	Score: ratio between deficits present within the total of 36 deficits. (Cut-off 0.08); Stratification: >0.08 Frail, <0.08 robust	Yes	Frailty: 60 Robust: 40
Groningen Frailty Indicator	Subjective	15 items (physical, cognitive, social and psychological functionality)	Score: 0–15; Stratification: 0–3: robust, >4: frail	Yes	22–46
Modified Frailty Phenotype	Objective	Handgrip strength, walking speed, unintentional weight loss and fatigue	Score: 0–4; Stratification: 0: robust, 1: prefrail, >2: frail	Yes	8.98–37.10
NCGG-FAT	Subjective	Memory, attention, executive function and processing speed	Score: 0–10; Stratification: >2: frailty cognitive (indicated by the age-compatible score (1.5 SD below the reference value)	No	5.2
Phenotype of frailty	Mixed	Handgrip strength, gait speed, unintentional weight loss, fatigue and physical activity level	Score: 0–5; Stratification: 0: robust, 1–2: prefrail, ≥3: frail	Yes	3–35
Sherbrooke Postal Questionnaire	Subjective (questionnaire)	6 items (physical, social, and cognitive domains of functioning)	Score: 0–6; Stratification: >2: frail	No	58.1

Continued

Table 3 Continued

Evaluation of frailty instrument	Type of evaluation	Components	Score and stratification	Validated in Brazil	Prevalence of frailty among studies (%)
Study of Osteoporotic Fractures Frailty Index	Mixed (physical performance evaluation and questionnaire)	Unintentional weight loss, inability to rise from a chair 5 times without the use of arms, and reduced energy level	Score: 0–3; Stratification: 0: robust, 1: prefrail, 2–3: frail	No	4.18
The cumulative deficit approach (Puts model)	Mixed (multidimensional)	Body weight, peak expiratory flow, cognition, presence of a vision problem a hearing problem or urinary incontinence—low mastery, depressive symptoms, and comorbidity	Score: None*; Stratification: 0: robust, 1–2: prefrail, >3: frail	No	38.5
The Kihon Checklist	Subjective (questionnaire)	25 items (activities of daily living 'basic and social', exercise, falls, nutrition, oral function, cognitive function and depression)	Score: 0–25; Stratification: 0–3: robust, 4–7: prefrail, 8–25: frail	Yes	7–17.2
Tilburg Frailty Indicator	Subjective (questionnaire)	25 items (determinants of frailty and diseases and components of frailty in three domains 'physical, psychologic and social frailty')	Score: 0–15; Stratification: 0–4: robust, >5: frail	Yes	27.10–45.83
Vulnerable Elders Survey-13	Subjective (questionnaire)	13 items (age, self-reported health, functional capacity, and physical condition)	Score: 0–10; Stratification: ≤2: robust, 3–6: risk of frailty, ≥7: frail	Yes	12–52.7

NCGG-FAT, National Center for Geriatrics and Gerontology-Functional Assessment Tool.

by memory bias. For this reason, authors such as Chang *et al*³⁰ advise the use of instruments that objectively assess the physical performance of patients, avoiding this type of bias.

Despite being a progressive condition, frailty can be prevented and rehabilitated.³¹ In this context, the instruments that allow the identification of prefrailty (frailty phenotype, Modified Frailty Phenotype, 5-frail, SOF FI, puts model, CGA) have positive aspects and stand out, since, when diagnosed early, functional changes resulting from frailty may have a better prognosis. Thus, the reversal of the situation becomes more likely when interventions are applied in the initial phase of frailty.³²

Among the instruments included in this research, it is analysed that 10 of them present validated measurements for Brazil in the assessment of frailty in community-dwelling older people (table 3). The Ministry of Health included in the new Health Handbook for the Elderly one of these questionnaires, the VES 13,^{33 34} in an attempt to promote a practical form of screening frailty to health-care professionals. PHC, since it has easy and fast application. The VES-13 is an effective instrument to identify the vulnerable community-dwelling older people, with an emphasis on data regarding age, self-perceived health, presence of physical limitations and disabilities.³⁵ The vulnerable older people was defined as that individual who is at risk of functional decline or death in 2 years.³⁶

Most instruments were developed abroad, with the exception of CFVI-20.³⁷ This tool was developed in the Brazilian context in a joint and interdisciplinary action, and is applicable in the outpatient and community setting. In addition to being a Brazilian tool, it was shown to be positively correlated to CGA, in addition to the results pointing to high values of validity and reliability.²¹

In the case of CGA, it is a very widespread instrument in Brazil and quite complete, as it evaluates the health of the older people in a global and multidisciplinary way, using various tools to achieve this goal.³⁸ This completeness also reflects one of its disadvantages, since the instrument is very large, requiring about 60–90 min for application, in addition to requiring several professionals to complete it.²¹ This often leads to limitation of its use in the reality of Brazilian PHC. Thus, it is important that health professionals know other, faster ways of screening to improve the identification of the frailty in older people.

The screening instruments for application in PHC must respect the context in which they are inserted, therefore, they must be of short duration, when possible, be administered by other means such as telephone and also by different professionals, allowing the reach a greater number of individuals, still being accurate about adverse results.³⁹

According to the Brazilian consensus on frailty in the older people,¹¹ the conceptual diversity of criteria and instruments reflects in areas such as assistance, teaching and research, making it difficult to choose instruments, compare results and compromise adequate training of professionals in the area. In this sense, this review becomes a guide since it

highlights instruments available in the literature for assessing the community-dwelling older people and also presents which of these have validation (and/or cross-cultural adaptation) in Brazil.

A limitation of the study is the search for studies with only an observational design. We opted for this search restriction since in this type of study design, it involves research using instruments, questionnaires, interviews, which most resembles the reality of PHC workers. Clinical research with a greater degree of methodological robustness and assessment equipment/instruments are not feasible to be developed in the context of PHC.

The differential of this research is the mapping of instruments that evaluate not only frailty but its stratifications (non-frail, prefrail, frail and robust), in addition to detailing of instruments that approach other constructs besides the physical function for the screening of frailty, such as: cognitive, social and psychological issues. Added to this, it also sought to analyse among the selected instruments those that have validity in Brazil, as well as to describe their potential for easy application, as suggested by previous studies.⁴⁰

Main learning

The data from this research provide the understanding that choosing the appropriate instrument to assess frailty is not simple, given the lack of global consensus regarding the definition of this syndrome. However, there are instruments in the literature that are validated, simple and that provide the screening of frailty in community-dwelling older people. Therefore, the choice of this instrument will depend on the objectives outlined by the evaluators, as well as the domains that they seek to analyse for this screening.

CONCLUSION

The assessment of frailty in PHC can be performed by several instruments. This review served as a guideline for professionals in this area, demonstrating 17 instruments applicable to the context of the community-dwelling older people, pointing out advantages and disadvantages in deciding on the instrument of use.

From all the tools analysed in this study, ten of them are validated in Brazil and one was built in the country itself. As no instrument considered to be the gold standard was verified, the choice of the instrument will depend on which domains the evaluators want to address for the screening and stratification of frailty.

Furthermore, this scoping review was a guide for further studies carried out by the same authors, which aim to compare instruments for assessing frailty in PHC.

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