Comparison of instruments for screening frailty in community-dwelling older adults

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ABSTRACT

Objective: To conduct a systematic review of studies that verify the comparison between frailty assessment instruments. Methods: Systematic review conducted between January and March 2023 in an electronic database (LILACS and MEDLINE). For the construction of the search strategies, an adaptation of the acronym PICO was used, where P = population (community-dwelling elderly), I: phenomenon of interest (comparison of frailty by different instruments) and CO = context (Primary Health Care). In the searches, the terms "elderly" AND "fragility" AND "instruments" and "Elderly" AND "fragility" AND "instrument" were considered, and the final selection resulted in 13 articles. Results: The comparison between the Edmonton Frailty Scale (EFS) and the Clinical Functional Vulnerability Index (IVCF-20) showed moderate agreement and a strong positive correlation. However, the prevalence of frailty was discrepant, being higher when EFE was used. When analyzing the agreement between the Subjective Assessment of Frailty (SFA) and the IVCF-20, the results indicated weak agreement in the classification of frailty between these instruments. However, moderate agreement was found when the outcome was dichotomized into "frail" and "non-frail". Despite evaluating similar concepts, SFA and IVCF-20 are complementary and one cannot replace the other. Conclusions: Although several studies address different frailty assessment instruments, there is still a scarcity of studies investigating the agreement between these instruments and, in addition, the results presented reinforce the need for a standardized instrument to measure frailty in the elderly in Primary Health Care.

Keywords: Aged, Frailty, Primary Health Care.

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INTRODUCTION

The Brazilian Institute of Geography and Statistics (IBGE) estimates that in the year 2060 an approximate number of 73.6 million elderly people is expected and, in relation to the long-lived (80 years or older) the number has also been increasing very quickly, constituting the population segment that has grown the most in recent times and is estimated to reach approximately 19 million in the year 2060.

Longevity involves numerous changes in the life of the elderly and, when associated with functional disability, can compromise functionality and health, depriving them of an autonomous and healthy life (Mirandola; Bós, 2016).

The aging process is accompanied by a set of physiological, psychological and social changes, which can trigger multiple syndromes, including frailty, which is a state of multidimensional change where there is increased vulnerability and decreased resistance to external stressors, increasing the chance of certain adverse health events, such as decreased strength, resistance and physiological function (Rodrigues *et al*., 2018).

Frailty Syndrome is related to different risk factors, and there is a consensus on its wide variability of aspects and conditions, including sociodemographic, clinical, lifestyle-related and biological domains, such as advanced age, female gender, ethnicity, access to health care, low education, low socioeconomic status/social vulnerability, isolation and/or loneliness, obesity, malnutrition, depression, cognitive deficit, multimorbidities, smoking, excessive alcohol consumption, and physical inactivity (Tavares *et al.*, 2022).

Recent studies show that frailty syndrome has a significant impact on the lives of older adults, their families, and health services (Duarte *et. al*, 2018; Maia *et al*., 2020).

Therefore, identifying frail older adults at risk of frailty is of fundamental importance, being a public health priority at all levels of health care, making it possible to guide interventions aimed at coping with the severity of the syndrome and minimizing adverse outcomes (Melo *et. al,* 2022).

In the context of Primary Health Care (PHC), the identification of factors associated with frailty in the elderly has the potential to reduce the impacts on the health system through public policies that organize an integrated care model centered on this portion of the population (Maia *et al*., 2020).

In addition, the evaluation of the main determinants of the health of the elderly in PHC and, consequently, their correct stratification, is essential for the guidance of health professionals in the elaboration of a care plan, indication of multidisciplinary interventions, identification of dimensions that deserve more detailed investigation and guidance for geriatric consultation, with the purpose of maintaining and improving the autonomy and independence of the elderly (Freitas *et al*., 2020).

Therefore, it is relevant to discuss and screen for frailty in the elderly population at the first level of health care (Ribeiro *et al*., 2022). The detection of Clinical Functional Frailty Syndrome (CFS) can be performed through the observation of risk factors and appropriate assessment instruments (Oliveira *et al*., 2021).

The literature offers several instruments for assessing frailty and, although some studies have used these instruments in the same target population, none of them have investigated their interscale agreement. This assessment is relevant because the lack of agreement between the assessment instruments and the inconsistency in the measurement of frailty can be a significant source of bias when reporting frailty outcomes (Melo *et al*., 2022).

The objective of this work, therefore, is to carry out a systematic review of studies that verify the comparison between the instruments for assessing frailty in the community context.

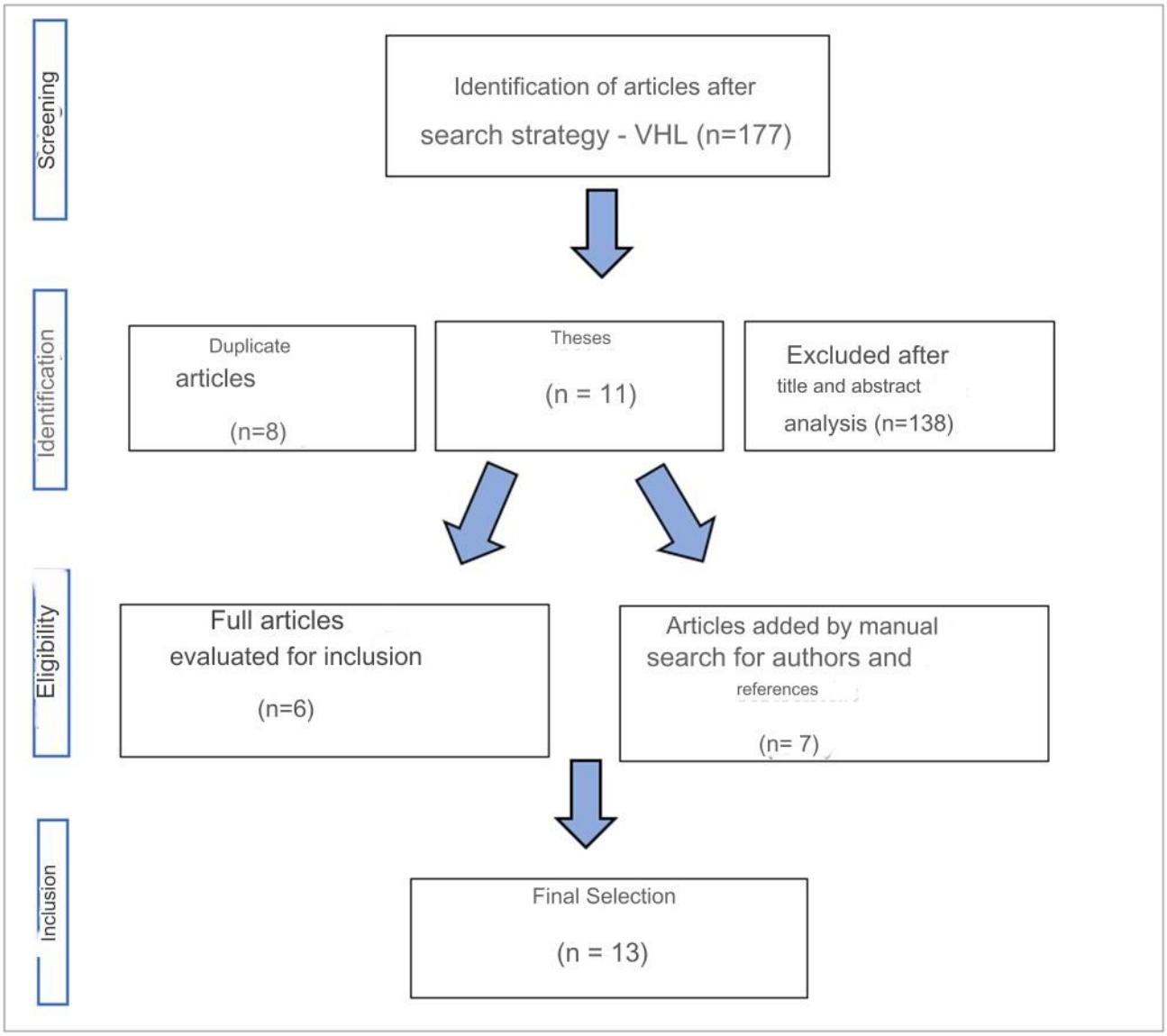
METHODS

The systematic review of the literature was initially carried out by searching for articles on instruments for assessing frailty syndrome in the elderly in an electronic database (LILACS and MEDLINE) identified during the months of January to March 2023.

For the construction of the search strategies, an adaptation of the acronym PICO was used, where P = population (community-dwelling elderly), I: phenomenon of interest (comparison of frailty by different instruments) and CO = context (Primary Health Care). The PICO strategy guides the elaboration of the research question and the bibliographic search, allowing the professional or researcher to carefully choose the most appropriate descriptors and combinations to be used. In the searches, the terms "elderly" AND "frailty" AND "instruments" and "Elderly" AND "fragility" AND "instrument" were considered, and the selection of these descriptors was made by consulting the *Medical Subject Headings* (MeSH) and the research question to be investigated was: "Is there a comparison of frailty screening instruments in community-dwelling older adults?". The following inclusion criteria were established: articles in Portuguese, English or Spanish, available in full and published in the last 5 years, whose participants were community-dwelling elderly aged 60 years or older, of both sexes. Theses, dissertations and monographs were excluded.

The selection of studies was carried out through the analysis of the titles and abstracts found, the articles that met the inclusion criteria were fully reviewed and, in order to find additional sources, the references of these articles were also analyzed.

Figure 1 – Selection scheme for articles on frailty assessment instruments – Brazil, 2023.



SOURCE: Authors, 2023.

RESULTS AND DISCUSSION

The review of the bibliographic databases identified 177 articles and after the analysis of titles and abstracts, 20 articles were obtained. By applying the inclusion and exclusion criteria, as well as the analysis of the full texts, six articles remained, among which only three addressed the comparison between different instruments for assessing frailty in community-dwelling older adults. These are cross-sectional studies that defined age 60 years or older as an inclusion criterion.

Regarding the assessment instruments, two of these studies evaluated the Edmonton Frailty Scale (EFS) and the Functional Clinical Vulnerability Index (IVCF-20) and one analyzed the agreement between the Subjective Frailty Assessment (SFA) and the Functional Clinical Vulnerability Index (IVCF-20).

The EFS is a scale for assessing frailty in the elderly developed by Rolfson et al. in 2006 at the University of Alberta, Edmonton, Canada. It evaluates nine domains: cognition, general health

status, functional independence, social support, medication use, nutrition, mood, continence, and functional performance, investigated by 11 items. Its maximum score is 17 and represents the highest level of fragility. The scores for frailty analysis are: 0-4, no frailty; 5-6, seemingly vulnerable; 7-8, mild frailty; 9-10, moderate frailty; 11 or more, severe frailty (Fabrício-Wehbe *et al.,* 2009).

The IVCF-20 is a questionnaire that contemplates multidimensional aspects of the health condition of the elderly, consisting of 20 questions distributed in eight sections: age (1 question), self-perception of health (1 question), functional disabilities (4 questions), cognition (3 questions), mood (2 questions), mobility (6 questions), communication (2 questions) and multiple comorbidities (1 question) and its score ranges from 0 to 40. The final score of 0 to 6 points indicates an elderly person at low risk of clinicofunctional vulnerability; from 7 to 14, moderate risk; and 15 or more, high risk, potentially fragile (Moraes *et al.*, 2016).

The Subjective Frailty Assessment evaluates five components of frailty with dichotomous responses (yes or no): unintentional weight loss, reduced strength, reduced walking speed, and low level of physical activity in the last year. "Frail" is considered "frail" is defined as those who score for three or more components, "pre-frail" is considered to be those who score positively for one or two, and "non-fragile" is considered to be those who do not present any of the components described. (Nunes *et al*., 2015).

When evaluating the Edmonton Frailty Scale (EFS) and the Functional Clinical Vulnerability Index (IVCF-20), the degree of agreement of the kappa coefficient between the two instruments was 0.496, showing a moderate and statistically significant agreement between them, which can be explained by the differences between the prevalence of frailty in both instruments (Ribeiro *et al*., 2022).

Analyzing the correlation between the total score of the IVCF-20 and EFS, a positive and significant correlation was found ($r = 0.77$; $p = 0.001$). Both instruments presented similar characteristics in relation to dimensions; however, the percentage of frailty was higher when using the EFE compared to the IVCF-20, which may be related to the assessment of the "cognition" dimension by the EFE, in which there was a high percentage of failure of older adults in the clock test of this instrument (Ribeiro *et al*., 2022).

These results corroborate the study conducted by Carneiro et. al, 2020, where the comparison between EFE and IVCF-20 showed moderate agreement and a strong positive correlation. The Kappa statistic revealed an agreement index of 0.599 between the instruments and Pearson's correlation coefficient between the EFS and IVCF-20 values was 0.755 ($p < 0.001$), however, the prevalence of frailty in community-dwelling older adults was also higher in EFE.

The difference between some components of the two scales may explain the discrepancy between the prevalences and, in addition, similar components are approached differently; the EFS

uses the clock test to assess "cognition" and the IVCF-20 addresses memory through the evocation of words. The clock test requires knowledge of numbers, and the low level of schooling among the Brazilian elderly may compromise the result. Therefore, poor performance in this test, which increases the prevalence of frailty, may be related to difficulties not necessarily linked to a cognitive deficit (Carneiro *et al.,* 2020).

In the study that analyzed the agreement between the Subjective Assessment of Frailty (SFA) and the Functional Clinical Vulnerability Index (IVCF-20), the results indicated weak agreement in the classification of frailty between the Subjective Assessment of Frailty and the CFVI-20, however, moderate agreement was found when the outcome was dichotomized into "frail" and "not frail" (Melo *et al*., 2022).

Considering the importance of diagnosing frailty, the interscale agreement for this outcome was analyzed, with the different profiles being dichotomized into non-frail (CFVI-20 ≤ 6; Subjective Assessment of Frailty < 3) and Frailty (CFVI-20 > 6; Subjective Assessment of Frailty > 3). Interscale agreement for the diagnosis of frailty occurred in 70.1% of the individuals, with a Kappa coefficient of 0.41 (95% CI: 0.32 to 0.48; $p < 0.001$), indicating a moderate level of agreement (Melo *et al*., 2022).

Thus, although the EFS and IVCF-20 instruments present similar characteristics in relation to dimensions, as well as moderate agreement and strong positive correlation, the prevalence of frailty pointed out was discrepant, being higher when EFE was used (Carneiro *et al.*, 2020; Ribeiro *et al*., 2022).

Meanwhile, when analyzing the agreement between the Subjective Assessment of Frailty (SFA) and the Functional Clinical Vulnerability Index (IVCF-20), the prevalence of frailty among the community-dwelling elderly was lower using the IVCF -20 (17.1%) compared to the SFA (59.8%), since the Subjective Assessment of Frailty is a more specific tool for the classification of frailty. as it considers the five components of Fried's phenotype, which is a more sensitive indicator. Thus, despite evaluating similar concepts, the two instruments are complementary and one cannot replace the other (Melo *et al*., 2022).

CONCLUSIONS

The recognition of the frail elderly is essential for the establishment of a line of care capable of recovering or maintaining the autonomy and independence of the elderly, promoting the indication of multidisciplinary interventions, identification of the dimensions that deserve a more detailed investigation and guidance for geriatric consultation.

Although several studies address different frailty assessment instruments, there is still a scarcity of studies investigating the agreement between these instruments.

In addition, the results presented reaffirm the need for a standardized instrument to measure frailty in the elderly in Primary Health Care.

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