



Review Article

Frailty assessment instruments used among Iranian older adults: A scoping review

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ARTICLE INFO

Received 31 May 2026

Accepted 27 July 2026

Available online at:
<https://npt.tums.ac.ir>

Keywords:

assessment tools;
frailty;
geriatric assessment;
Iran;
older adults;
scoping review

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DOI: 10.18502/npt.v13i4.23016

ABSTRACT

Background & Aim: Frailty is a common but heterogeneous geriatric syndrome, and numerous instruments have been developed for its assessment. Although several have been applied to older adults in Iran, their use has not been comprehensively mapped. This scoping review aimed to map frailty assessment instruments used among Iranian older adults and describe their characteristics and patterns of use.

Methods & Materials: Following the methodological framework of Arksey and O'Malley and reported in accordance with PRISMA-ScR guidelines, we searched Scopus, PubMed, Web of Science, Embase, SID, and Magiran, supplemented by Google Scholar and reference-list screening. Primary studies involving adults aged ≥ 60 years in Iran that used a specific instrument or approach to assess frailty were eligible for inclusion. Studies published in Persian or English with accessible full text were considered, regardless of publication date.

Results: Of 719 records identified, 77 studies met the eligibility criteria, identifying 13 instruments. The Fried Frailty Phenotype was most frequently used (31 studies; 40.3%), followed by the Tilburg Frailty Indicator (17; 22.1%) and Frailty Index (8; 10.4%); most instrument applications were community-based (54; 67.5%). Only nine instruments had independent psychometric evaluation in Iran (13 studies), while the FRAIL Scale, Clinical Frailty Scale, PRISMA-7, and Frailty Index for Elders had none. The Comprehensive Frailty Assessment Instrument-Plus covered the broadest range of frailty domains among the identified instruments but was infrequently used in Iranian studies.

Conclusion: Frailty assessment in Iran relies mainly on the physical phenotype tool in community-dwelling older adults, with limited multidimensional coverage. No instrument was developed for this population, and several widely used tools lack local validation. Tool choice should match the assessment's purpose, and future studies should cover under-researched settings such as hospitals and nursing homes.

Introduction

Population ageing is one of the most significant demographic transitions of the twenty-first century, and frailty has emerged as one of the most important geriatric syndromes associated with this transition (1). Frailty is characterized by a decline in physiological reserve and an increased vulnerability to internal and external stressors, resulting from impairments across multiple physiological systems and a reduced capacity to maintain homeostasis (2). Compared with their robust counterparts, frail older adults are at substantially higher risk of functional disability, reduced quality of life, hospitalization,

institutionalization, recurrent hospital admissions, increased care dependency, and premature mortality (3). These adverse outcomes impose a considerable economic and social burden on healthcare systems and families, making the early identification and screening of frailty a public health priority (4). Importantly, frailty is not an inevitable consequence of ageing and may be prevented or delayed. Early identification through appropriate frailty assessment allows timely interventions that may reduce adverse health outcomes, optimize healthcare delivery, and improve the quality of life of older adults (5, 6).

Please cite this article as: Imani M, Nobahar M. Frailty assessment instruments used among Iranian older adults: A scoping review. Nurs Pract Today. 2026; 13(4): 404-423.



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Despite its clinical and public health significance, there is still no universal consensus regarding the definition of frailty or the most appropriate method for its assessment, and a wide variety of approaches have been adopted across studies (1).

Frailty was initially conceptualized primarily as a physical condition. The frailty phenotype proposed by Fried et al., based on unintentional weight loss, muscle weakness, exhaustion, slow walking speed, and low physical activity, remains one of the most widely used approaches for assessing physical frailty (7). Over the past two decades, however, frailty has increasingly been recognized as a multidimensional construct encompassing not only physical but also psychological, cognitive, social, and, in some models, economic domains (8). Instruments such as the Frailty Index, which quantifies the accumulation of health deficits, multidimensional assessment models, and comprehensive frailty questionnaires have been developed to provide a broader evaluation of frailty in older adults (9). Consequently, the choice of assessment instrument depends largely on the purpose of assessment, the clinical or research setting, and the characteristics of the target population, contributing to considerable heterogeneity in how frailty is measured and reported across studies (4, 10). These models target different aspects of frailty, and no consensus currently exists on which should be privileged (1). Because both unidimensional and multidimensional instruments have been widely applied in Iranian research across hospital and community settings, mapping their use jointly, rather than restricting the review to one model a priori, is warranted to provide a comprehensive picture of how frailty is currently operationalized in Iran and to clarify the domains assessed by each instrument.

In Iran, growing attention has been directed toward frailty research alongside the rapid increase in the older population. Although several studies have investigated frailty among Iranian older adults, the assessment approaches used vary considerably in both conceptual framework and methodological characteristics (5, 11-13). Most existing studies have focused on the prevalence of frailty or its associated factors, whereas comparatively little attention

has been paid to systematically identifying and comparing the assessment instruments employed. To our knowledge, no previous review has comprehensively mapped the frailty assessment instruments used among Iranian older adults to describe their operational characteristics and patterns of use across study populations and settings. Systematically documenting which instruments are used, how frequently, and in what settings is essential for clarifying current assessment practices and identifying gaps in existing research. Accordingly, this scoping review aimed to map the frailty assessment instruments used among Iranian older adults and describe their characteristics and patterns of use across study populations and settings.

Methods

Study design

This scoping review aimed to identify and map frailty assessment instruments used among Iranian older adults, including their frequency and patterns of use, characteristics, and conceptual coverage. The review was conducted following the five-stage framework proposed by Arksey and O'Malley, including identification of the research question, literature searching, study selection, data charting, and synthesis of the findings (14). The review was reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) guidelines (15). The protocol for this scoping review was registered in the Open Science Framework (<https://osf.io/8aht5>).

Research question

The research question was developed using the Population–Concept–Context (PCC) framework (16). The population comprised adults aged ≥ 60 years, the concept focused on frailty assessment instruments and their patterns of use, and the context was studies conducted in Iran. This review addressed the following question: Which frailty assessment instruments have been used among older adults in Iran, and what are their patterns of use and characteristics across study populations and settings?

Inclusion and exclusion criteria

Studies involving adults aged ≥ 60 years that used a specific instrument or approach to assess frailty were eligible for inclusion. This included studies that examined the prevalence of frailty, its associated factors, or other frailty-related outcomes, provided that the instrument or approach used to assess frailty was clearly reported. Primary studies, including cross-sectional, longitudinal, cohort, case-control, and interventional designs, published in Persian or English with accessible full text were considered, regardless of publication date. No single conceptual definition of frailty was imposed as an eligibility criterion; rather, the underlying conceptual and operational definition of each instrument was extracted, allowing the conceptual diversity across instruments to be characterized as an empirical finding, which is described in the results.

Studies that applied this same age threshold, or a higher threshold such as ≥ 65 years, were eligible with respect to age; no study was excluded merely because it used one of these thresholds rather than the other. For studies whose own eligibility criteria specified a lower age threshold (e.g., ≥ 55 years) or a broad adult age range without a specific threshold for older adults (e.g., ≥ 18 years), eligibility for this review required that the reported mean age of the sample be ≥ 60 years and, where the percentage of participants aged ≥ 60 years was reported, that this percentage confirm that most of the sample were older adults; a mean age of ≥ 60 years alone, without evidence that the sample was predominantly composed of older adults, was not sufficient. Studies whose sample was not predominantly composed of older adults were excluded. Review articles, scoping reviews, systematic reviews, meta-analyses, editorials, letters to the editor, conference abstracts, studies without accessible full text, and studies that did not report or describe any frailty assessment instrument or approach were excluded.

Search strategy

A comprehensive search was conducted in PubMed, Scopus, Embase, Web of Science, SID, and Magiran from database

inception to June 29, 2026. The Google Scholar search engine was also reviewed as a supplementary source. The first 200 results, sorted by relevance, were screened. Reference lists of all eligible articles were manually screened, and automatic alerts were activated in PubMed and Scopus to identify newly published studies during the review process. During the revision process, an updated Google Scholar search using the same approach identified three additional records published after the original search date; these were screened against the eligibility criteria described above and included.

The search strategy was developed according to the study objectives using Medical Subject Headings (MeSH) and free-text terms. The main search terms included "*Frailty*," "*Frailty syndrome*," "*Frail elderly*," "*Aging*," "*Aged*," "*Older adults*," "*Elderly*," "*Iran*," "*Iranian*," and "*Persian*." Persian equivalents of these terms were used when searching SID and Magiran. Keywords were combined using the Boolean operators AND and OR, with modifications to match the indexing structure of each database. No restrictions were applied regarding publication date or language during the search process itself; however, consistent with the eligibility criteria described above, only studies published in Persian or English were retained for inclusion in the review. The complete PubMed search strategy is provided in Table 1. The complete search strategies for the remaining databases (Scopus, Embase, and Web of Science) are provided in Supplementary Tables S1-3.

Study selection

All retrieved records were imported into EndNote X9 (Clarivate Analytics, Philadelphia, PA, USA), and duplicate records were removed automatically and manually. Two reviewers independently screened the titles and abstracts according to the predefined eligibility criteria.

Full texts of potentially eligible studies were then assessed, and studies meeting the inclusion criteria were selected for data extraction. Disagreements between reviewers were resolved through discussion until consensus was reached. The study selection

process is presented in the PRISMA-ScR flow diagram.

Data extraction

A standardized data extraction form was developed by the research team. Two reviewers independently extracted data from the included studies, and any discrepancies were resolved through discussion and consensus. Extracted data included the authors, publication year, study design, study population, frailty assessment instrument or approach, and the frequency of use

of each instrument across Iranian studies. Additional information collected for each instrument included the country of development, number of items, target population, assessed domains, components, assessment method, scoring method, cut-off values, and administration time. These characteristics were obtained primarily from the original development or validation studies of the instruments and were summarized comparatively in Table 2.

Table 2. Characteristics of the original frailty assessment instruments

Tool	Author (Year)	Country of origin	Items	Target population	Domain	Components	Method	Scoring	Time (min)
FFP	Fried et al., 2001 (7)	United States	5	Community-dwelling older adults	Phy	Weight loss, exhaustion, weakness, slowness, low physical activity	Self-report, performance-based	0–5; frail ≥ 3 ; pre-frail: 1–2	15
CFS	Rockwood et al., 2005 (17)	Canada	1	Community-dwelling and institutionalized older adults	Phy Cog	Physical function, ADL/IADL dependence, Cognitive, comorbidity	Judgment-based	Ordinal Scale: 1–7 (from robust To complete dependence)	5
FRAIL	Morley et al., 2012 (18)	USA	5	Community-dwelling middle-aged adults	Phy	Fatigue, Resistance, Ambulation, Illness, weight Loss	Self-report	0–5; frail ≥ 3 ; pre-frail: 1–2	<10
FI*	Searle et al., 2008 (9)	Canada	40	Community-dwelling older adults	Phy Psy Cog Soc	Accumulated health deficits: signs, symptoms, disabilities, diseases	Self-report, performance-based	0–1; continuous frail >0.25	20–30
PRISMA-7	Raïche et al., 2008 (19)	Canada	7	Community-dwelling older adults	Phy Soc	Age >85 years, male sex, activity limitation, need for help, health problems, social support, mobility	Self-report	0–7; frail ≥ 3	3
EFS	Rolfson et al., 2006 (20)	Canada	11	Older adults in clinical settings	Phy Psy Cog Soc	Cognition, mood, health status (2 items), functional independence, social support, functional performance, medication (2 items), nutrition, continence	Self-report, performance-based	0–17; frail ≥ 7 ; higher score = greater frailty	<5
GFI	Steverink et al., 2001 (21)	Netherlands	15	Community-dwelling older adults	Phy Psy Cog Soc	Shopping, walking, dressing, fitness, toileting, vision, hearing, weight loss, emptiness, amnesia, polypharmacy, missing others, rejection, sadness, nervous/anxious	Self-report	0–15; frail ≥ 4	<15
TFI	Gobbens et al., 2010 (22)	Netherlands	15	Community-dwelling older adults	Phy Psy Cog Soc	Nutrition, physical activity, strength, endurance, balance, vision, hearing, mobility, social support, loneliness, cognition, depression, anxiety, coping, social relations	Self-report	0–15; frail ≥ 5	<15

Tool	Author (Year)	Country of origin	Items	Target population	Domain	Components	Method	Scoring	Time (min)
FIFE	Tocchi et al., 2014 (23)	USA	10	Community-dwelling older adults	Phy Psy Soc	Perceived activity, self-care, weight changes, oral issues, appetite, social activities, overall health, fatigue, hospitalization, emergency visits	Self-report	0–10; frailty risk: 1–3; frail ≥ 4	10
PFFS	Theou et al., 2019 (24)	Canada, UK, Malaysia	14	Patients, caregivers, and health-care professionals	Phy Psy Cog Soc	Mobility, function, balance, vision, hearing, continence, mood, pain, weight loss, social connection, cognitive, fatigue, aggression, drug	Self-report or informant/clinician-rated	Each domain: 3–6 response levels; raw 0–43; FI = raw/43	3–6
CFAI-Plus	De Roeck et al., 2018 (25)	Belgium	27	Community-dwelling older adults	Phy Psy Soc Env Cog	Physical limitations (4 items), mood (5 items), emotional loneliness (3 items), social isolation (3 items), social network (3 items), housing and environmental (5 items), cognitive complaints (4 items)	Self-report	Each domain: 0–100; 3 levels: not-to-low/low-to-mild/mild-to-high	10–15
SFS	Pek et al., 2020 (26)	Singapore	8	Community-dwelling older adults	Soc	Social resources (3 items), social/financial activities (3 items), social need fulfillment (2 items)	Self-report	0–8; pre-frail: 2–3, frail: 4–8	3–5
GFST	Vellas et al., 2013 (27)	France	6	Community-dwelling older adults without disability or acute disease	Phy Cog Soc	Living alone, weight loss, fatigue, mobility, memory complaints, gait speed	Clinician-administered	No numerical score	3–5

NOT: Phy: Physical; Psy: Psychological; Cog: Cognitive; Soc: Social; Env: Environmental

*The Frailty Index follows a cumulative-deficit model in which item count can vary by dataset. Iranian studies in this review used versions ranging from 24 to 70 items (FI-24, FI-30, FI-40, FI-42, FI-70).

FFP, Fried Frailty Phenotype; CFS, Clinical Frailty Scale; FRAIL, Fatigue, Resistance, Ambulation, Illness, and Loss of Weight Scale; FI, Frailty Index; PRISMA-7, Program of Research to Integrate Services for the Maintenance of Autonomy-7; EFS, Edmonton Frail Scale; GFI, Groningen Frailty Indicator; TFI, Tilburg Frailty Indicator; FIFE, Frailty Index for Elders; PFFS, Pictorial Fit-Frail Scale; CFAI-Plus, Comprehensive Frailty Assessment Instrument-Plus; SFS, Social Frailty Scale; GFST, G rontop le Frailty Screening Tool

Each instrument's conceptual framework was classified with reference to three broad paradigms recognized in the frailty literature (1): the physical phenotype paradigm, which conceptualizes frailty primarily as a biological and physiological syndrome (7); the cumulative deficit model, which defines frailty as an accumulation of health and functional deficits (9); and multidimensional or biopsychosocial models, which explicitly incorporate cognitive, psychological, social, or environmental dimensions alongside physical frailty (8). Some instruments relied primarily on pragmatic clinical judgment rather than a fixed algorithmic scoring of predefined domains (1). For instruments grounded in a distinct theoretical framework outside these paradigms, or not originally developed as a frailty-specific instrument, the instrument's own conceptual basis is described directly in the Results rather

than mapped onto one of the paradigms above. This classification was based on the conceptual framework described in each instrument's original development study.

For conceptual coverage, the domains and components assessed by each instrument were extracted and mapped into five broad conceptual categories: physical, psychological, cognitive, social, and environmental. A domain was considered present when it was explicitly identified as a domain, subdomain, or component of the instrument, or was represented by items addressing that dimension. This information was derived primarily from each instrument's original development or validation study; where the original source did not specify a domain structure, the classification adopted in previously published reviews of the same instrument was used instead (28), and item content was consulted only in the rare instances

where neither source clarified the instrument's domain structure. Instruments were then compared in terms of domain breadth, based on the number of these five categories they addressed, as summarized in Table 2.

Data analysis

The extracted data were summarized using descriptive analysis. First, all eligible studies were used to map the use of frailty assessment instruments in Iran, including the frequency of use and application settings (Table 3). The characteristics of all included studies, author, year, study design, setting, sample size,

and the frailty assessment instrument used, were tabulated in Supplementary Table S4. For each included study, Table 3 and Supplementary Table S4 also record whether it qualified as an Iranian validation study for the frailty instrument used, so that the availability of such evidence can be tracked alongside the instrument-use mapping. Instrument characteristics, conceptual coverage, scoring structure, mode of administration, and the availability of independent validation in Iran were then summarized in comparative tables (Table 2). The included studies are cited in Table 3, grouped by frailty assessment instrument.

Table 3. Pattern of use of frailty assessment tools in Iranian studies

Instrument	N	%	IPS (n)	Application environment			References
				CD	H/C	NH	
Fried Frailty Phenotype (FFP)	31	40.3	3	22	7	2	(13, 29-58)
Tilburg Frailty Indicator (TFI)	17	22.1	2	12	5	-	(59-75)
Frailty Index (FI)	8	10.4	1*	6	2	-	(45, 54, 76-81)
FRAIL Scale (FRAIL)	6	7.8	-	5	1	-	(11, 12, 82-85)
Edmonton Frail Scale (EFS)	5	6.5	2	2	3	-	(86-90)
Clinical Frailty Scale (CFS)	3	3.9	-	-	3	-	(83, 91, 92)
Groningen Frailty Indicator (GFI)	2	2.6	1	0	1	1	(93, 94)
Comprehensive Frailty Assessment Instrument Plus (CFAI-Plus)	2	2.6	1	2	-	-	(5, 95)
Social frailty scale (SFS)	2	2.6	1	2	-	-	(96, 97)
The Program of Research to Integrate the Services for the Maintenance of Autonomy (PRISMA-7)	1	1.3	-	1	-	-	(98)
The Frailty Index for Elders (FIFE)	1	1.3	-	1	-	-	(99)
Pictorial Fit-Frail Scale (PFFS)	1	1.3	1	-	1	-	(100)
Gerontopole Frailty Screening Tool (GFST)	1	1.3	1	1	-	-	(101)

N: Number of studies; some studies used more than one instrument simultaneously; therefore, the total N exceeds the number of included studies.

Note: The full list of included studies by instrument is provided in Supplementary Table S4.

IPS = Iranian Psychometric Studies; CD: Community-Dwelling; H/C: Hospital/Clinic; NH: Nursing Home

*Only predictive validity was reported.

Results

A systematic search of electronic databases yielded 508 records. An additional 211 records were identified through supplementary sources, comprising 203 records from Google Scholar and 8 records from reference-list screening. Accordingly, a total of 719 records entered the screening stage. After removing 243 duplicate records, 476 studies were screened by title and abstract, of which 360 records were excluded due to lack of relevance to the research topic, leaving 116 records for full-text assessment. At the full-text assessment stage, 39 studies were excluded for the following reasons: lack of accessible full text (n=20), lack of

relevance to the review topic (n=9), absence of a described frailty assessment instrument (n=6), ineligible population (n=3), and superseded by a subsequently published peer-reviewed version (n=1); ultimately, 77 studies met the eligibility criteria and were included in the final review (Figure 1). The characteristics of all included studies are provided in Supplementary Table S4. The included studies enrolled a total of 57,771 participants, with individual study sample sizes ranging from 50 to 9,199. In terms of study design, most included studies were cross-sectional (n=66), while the remainder were longitudinal (n=3), prospective cohort (n=4), retrospective cohort (n=2), or interventional (n=2).

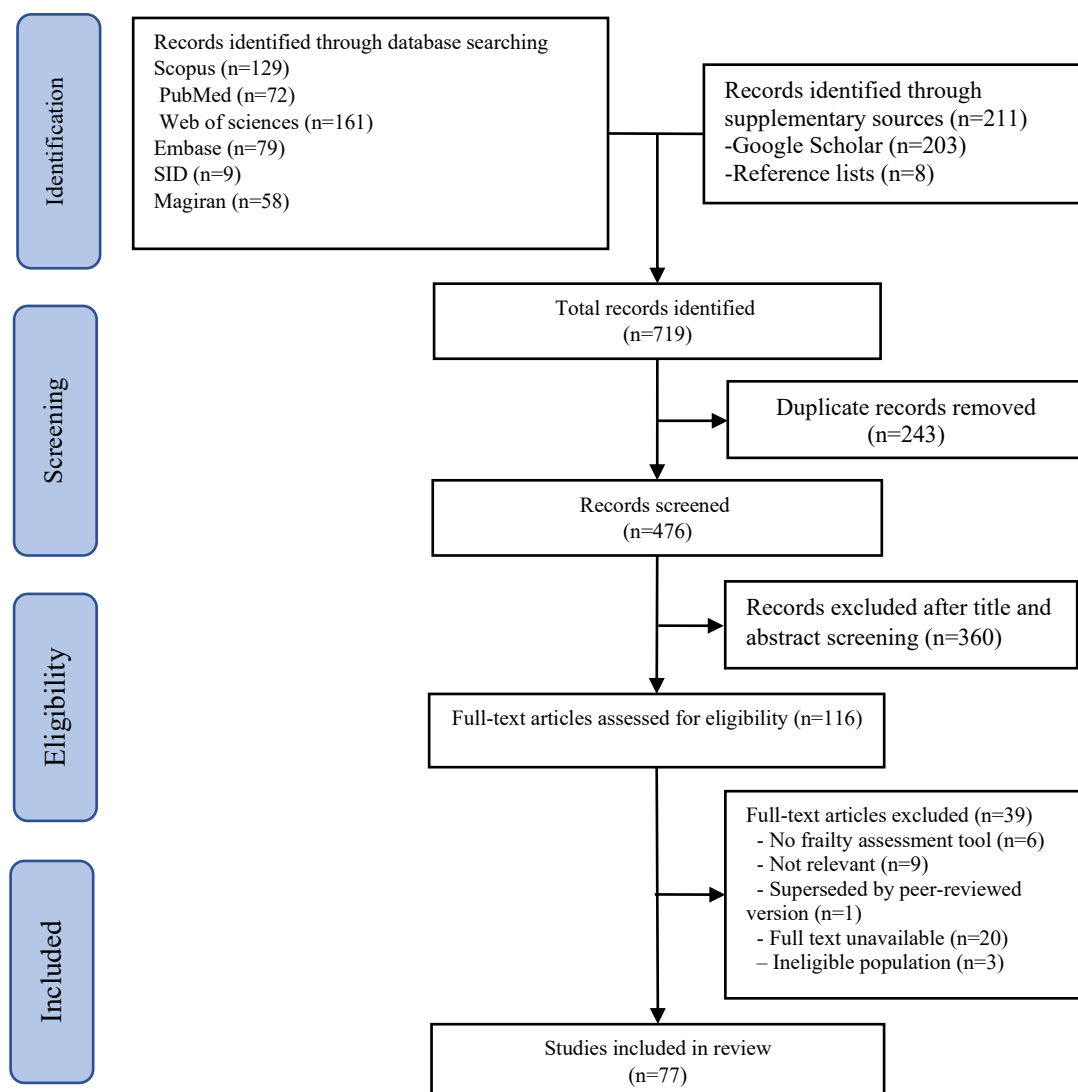


Figure 1. PRISMA-ScR flow diagram of study selection

Characteristics of the identified instruments

A total of 13 different instruments were identified for assessing frailty among Iranian older adults. These instruments differed considerably in their conceptual framework, measurement formats, item numbers (ranging from 5 items in the FRAIL and FFP to 70 items in the FI), and target domains, and could be broadly classified into unidimensional and multidimensional instruments. The identified instruments were the Fried Frailty Phenotype (FFP) (7), the Frailty Index (FI) (9), the Tilburg Frailty Indicator (TFI) (22), the Edmonton Frail Scale (EFS) (20), the Clinical Frailty Scale (CFS) (17), the seven-item Program of Research to Integrate Services for the Maintenance of Autonomy (PRISMA-7)

(19), the Groningen Frailty Indicator (GFI) (21), the FRAIL Scale (18), the Comprehensive Frailty Assessment Instrument-Plus (CFAI-Plus) (25), the Pictorial Fit-Frail Scale (PFFS) (24), the Frailty Index for Elders (FIFE) (23), the G rontop le Frailty Screening Tool (GFST) (27), and the Social Frailty Scale-8 (SFS-8) (26). The operational characteristics of each instrument are presented in Table 2. Domain coverage varied considerably across instruments: the CFAI-Plus was the only instrument addressing all five conceptual domains (physical, psychological, cognitive, social, and environmental) (25), whereas the FFP and SFS-8 each addressed a single domain (physical (7) and social (26), respectively) (Table 2).

In terms of administration mode, seven instruments relied entirely on self-

report (18, 19, 21, 22, 23, 25, 26), four combined self-report with performance-based items (FFP, FI, EFS, PFFS) (7, 9, 20, 24), and two (CFS and GFST) (17, 27) were completed through clinician judgment rather than a structured self-report or performance-based format. Regarding scoring structure, six instruments, the FFP, FRAIL Scale, CFS, FIFE, SFS-8, and CFAI-Plus, had the capacity to grade frailty severity or identify an intermediate pre-frail/at-risk state, rather than relying on a single binary cut-off (7, 17, 18, 23, 25, 26). Three instruments, the FI, EFS, and PFFS, used a continuous score alongside a single clinical cut-off (9, 20, 24), while PRISMA-7, GFI, and TFI were scored using a single binary cut-off (19, 21, 22); the GFST did not generate a numerical score (27). Of the 13 instruments, nine had undergone independent validation across 13 studies in Iranian populations (Table 2) (29-31, 59, 60, 76, 86, 87, 93, 95, 96, 100, 101).

Frequency of instrument use

The following results are based on all included studies that used frailty assessment instruments and are intended to describe patterns of instrument use rather than measurement quality. Among the identified instruments, the FFP had the highest frequency of use in Iranian studies (N= 31; 40.3%), followed by the TFI (N= 17; 22.1%) and the FI (N= 8; 10.4%). The remaining instruments were used considerably less frequently: the FRAIL Scale (N= 6), EFS (N= 5), CFS (N= 3); the CFAI-Plus, SFS-8, and GFI (N= 2); and the PRISMA-7, PFFS, FIFE, and GFST (each N= 1), reflecting their limited application in Iranian research (Table 3). In terms of dimensional scope, the FFP was the most frequently utilized tool among unidimensional/physical instruments (accounting for 40.3% of included studies), while the TFI was the most common among multidimensional instruments (22.1%) (Table 3). Study locations spanned 29 regions of Iran; Tehran alone accounted for the largest share of instrument-use studies (19/77, ~25%) and of Iranian validation studies (4/13, ~31%).

Application setting of the instruments

Frailty instruments in Iran have been applied predominantly among community-dwelling older adults (N=54 of 80 instrument applications; 67.5%), with substantially fewer applications in clinical and institutional settings. For example, among the studies utilizing the FFP, the vast majority were conducted in community settings (N= 22), with only a minority applied in hospital or nursing-home environments (N= 9). A similar pattern was observed for the FI and the TFI, both of which were predominantly used in community-based studies (Table 3).

Conceptual structure of the instruments

The conceptual definition of frailty was not uniform across the included studies. Rather than adhering to a single definition, each study's operationalization of frailty was governed by the conceptual framework of the instrument it used. Among the identified instruments, the FFP (7) and FRAIL Scale (18) reflected the physical phenotype paradigm; the FI (9) reflected the cumulative deficit model; and the TFI (22), CFAI-Plus (25), PFFS (24), FIFE (23), EFS (20), and GFI (21) reflected multidimensional or biopsychosocial models. A further subset of instruments, including the CFS (17) and GFST (27), relied primarily on pragmatic clinical judgment rather than a fixed algorithmic scoring of predefined domains. The SFS-8 was grounded in the Social Production Function theory (26), reflecting a distinct theoretical basis focused specifically on the social dimension of frailty. The PRISMA-7 was originally developed as a case-finding tool for disability risk based on an epidemiological review of risk factors for functional decline (19), rather than derived from a specific theoretical frailty paradigm.

Discussion

As the assessment of frailty becomes increasingly integrated into routine geriatric care (1), a clear, up-to-date picture of which instruments are available for use among Iranian older adults, and what is known about their local use and evidence, is essential for informed instrument selection. This scoping

review mapped the frailty assessment instruments used among Iranian older adults and the local evidence reported for these instruments. Four main patterns emerged. First, instrument use was concentrated on a limited number of measures, particularly the Fried Frailty Phenotype (FFP), despite the identification of 13 different instruments. Second, predominantly physical instruments were used more often than multidimensional measures. Third, measurement-property evidence was unevenly distributed, with four instruments (PRISMA-7, FRAIL, CFS, and FIFE) having no locally reported measurement-property or predictive-validity evidence. Finally, most applications were conducted among community-dwelling older adults, with fewer studies in hospital and nursing-home settings. These findings describe the current pattern of frailty assessment in Iran but do not establish the superiority or overall suitability of any individual instrument.

The predominance of the FFP in Iranian studies represents an important pattern in the application of frailty assessment rather than evidence of its superiority over alternative approaches. The FFP has a longstanding position in frailty research internationally and assesses frailty using five physical criteria: unintentional weight loss, exhaustion, weakness, slow walking speed, and low physical activity (7). However, its predominantly physical orientation means that it does not explicitly assess the psychological, cognitive, social, or environmental dimensions included in some multidimensional models of frailty (28, 102). Some FFP components also require objective physical measurements and specific equipment, such as a dynamometer for grip strength and standardized assessment of walking speed, which may impose practical requirements for administration in settings where such equipment or trained personnel are not routinely available (7, 103). In the Iranian primary and community-care context, where resources and staff time can be limited, this requirement may itself influence which instrument is feasible to administer. At the same time, purely self-reported items, of the kind used in several other identified instruments, are not free of limitations either; responses to questions that ask older adults to

recall symptoms, weight change, or activity levels over preceding days or weeks can be affected by recall bias, a recognized concern in self-assessed health measures among older populations (104). These characteristics do not make the FFP, or self-reported instruments, inherently inappropriate; rather, they show that different instruments capture different aspects of frailty and require different types of assessment, each with its own practical trade-offs. Its frequent use in Iran should therefore be interpreted as evidence of the continued prominence of the physical phenotype approach, not as evidence of greater comprehensiveness or psychometric superiority.

The relatively limited use of multidimensional instruments is notable given the broader conceptualization of frailty reflected in contemporary models. Instruments such as the TFI, FI, EFS, GFI, and CFAI-Plus encompass multiple physical, psychological, cognitive, social, or environmental domains and thus represent broader conceptual approaches to frailty (9, 20-22, 25). This breadth also reflects, in part, how individual instruments evolved over time: the original Comprehensive Frailty Assessment Instrument (CFAI) already distinguished itself from other multidimensional instruments by including an environmental domain when it was first developed in 2013 (105), but did not initially assess cognitive frailty; a cognitive domain was added five years later, yielding the five-domain CFAI-Plus used in the present review, which remains the only identified instrument that explicitly assesses an environmental domain with its own scoring subscale (25). This broader coverage did not, however, translate into wider adoption: despite covering the most domains among the identified instruments, the CFAI-Plus was among the least frequently used in the Iranian studies reviewed here (Table 3), illustrating that domain breadth and frequency of local use are independent considerations, not indicators of relative merit. However, these instruments do not all assess the same domains or use the same scoring methods. For example, whereas the CFAI-Plus separates physical, psychological, social, environmental, and cognitive frailty into distinct subscales (25),

the TFI assesses physical, psychological, and social frailty jointly (22). Such structural differences should not be interpreted as evidence of superior clinical utility, as no comparative evaluation was conducted in this review. Instead, they show that the instrument selected by researchers can affect which aspects of frailty are assessed and how frailty is defined in a study. Instruments should not be assumed to provide the same type or amount of information simply because they are classified as multidimensional. In addition, the extent to which each dimension is represented differs across instruments; therefore, the inclusion of a domain does not necessarily mean that all multidimensional instruments assess that domain with the same level of detail. These differences may also contribute to variation in the reported prevalence of frailty and associated factors across studies (106), which should be considered when interpreting and comparing findings in the Iranian literature.

An important finding of this review was how unevenly local validation had been undertaken across the identified instruments. Although 13 instruments were identified, only nine had undergone some form of validation in at least one Iranian study (Table 3). Four instruments in active use in Iranian research, the FRAIL Scale, CFS, PRISMA-7, and FIFE, had not been assessed locally at all. This pattern indicates that the use of an instrument in Iranian research has not necessarily been accompanied by local evaluation of its performance; the findings therefore describe whether such evidence exists for each instrument, not whether it is adequate or whether one instrument has stronger support than another. Because this review did not extract or compare specific properties or outcomes across studies, no conclusions can be drawn about the type, adequacy, or comparative strength of the available evidence. Frequency of use and the extent of local evaluation represent two independent aspects of the evidence base and should not be considered proxies for one another. An instrument may be widely used in Iranian research while having limited local psychometric evidence, as observed for the FFP, whereas a less frequently used instrument

may have undergone more focused evaluation. Neither pattern should be interpreted as an indicator of an instrument's overall quality.

Another important gap concerns the settings in which frailty instruments have been studied. More than 65% of instrument-use instances were among community-dwelling older adults, whereas hospital and nursing-home populations, where frailty prevalence is substantially higher than in community settings (107), were less frequently represented. This imbalance limits the extent to which community-based findings can be applied to more clinically complex or institutional settings, which is clinically important given that frailty has been identified as a significant risk factor for postoperative delirium in cardiac surgical intensive care patients and that integrating frailty screening into clinical protocols has been recommended (108). Geographic representation followed a similar pattern: study locations spanned 29 regions across Iran, yet Tehran alone accounted for roughly one-quarter of instrument-use studies and remained the single most frequent source of local evidence. In addition, few included studies specifically targeted rural older adults, although functional limitations and related geriatric conditions, such as sarcopenia risk, are common in rural populations (109). Future research prioritizing underrepresented provinces and rural areas would strengthen the generalizability of both usage patterns and local evidence. Relatedly, none of the identified instruments was originally developed for Iranian older adults; all are translations or cultural adaptations of instruments developed elsewhere. Cultural, social, and healthcare-system factors, such as family structure, living arrangements, and access to health and social services, may influence how certain items are understood or performed in these contexts (110). However, this review was not designed to formally assess cross-cultural equivalence, and this finding should therefore be read as a research gap rather than evidence that existing instruments are culturally inappropriate. Further cultural adaptation of existing instruments, or development of a context-specific measure, may help address this gap.

These findings have implications for both research and practice. Instrument selection should consider the purpose of assessment, the dimensions of frailty of interest, the target population, and the setting. This review can help researchers and clinicians identify which instruments have been used in comparable Iranian populations and what local evidence has been reported for them. However, because the methodological quality of the primary studies was not formally appraised and comparative performance was not assessed, the review does not provide a basis for ranking instruments or identifying a single best choice for clinical use. Brief instruments may be more practical where rapid screening is required, whereas multidimensional instruments may be preferable when several domains need to be assessed (1). For example, among the instruments reviewed here, the FI required the most administration time, followed by the CFAI-Plus, whose five-domain structure likewise required more time than brief, narrow-domain instruments such as PRISMA-7; in high-volume Iranian primary care settings, where time per patient is limited, this variation in administrative burden may be as practically relevant to instrument selection as domain coverage itself. Instruments also differed in their capacity to capture the frailty continuum. Six instruments (FFP, FRAIL Scale, CFS, FIFE, SFS-8, and CFAI-Plus) were capable of staging frailty severity or identifying a pre-frailty state, three (FI, EFS, PFFS) produced continuous or graded scores; three (PRISMA-7, GFI, TFI) relied on a single binary cut-off, and one (GFST) yielded no numerical score. In settings where early identification of pre-frailty is a priority, to allow intervention before functional decline becomes established, instruments with staging or pre-frailty detection capacity may offer a practical advantage over single-cut-off screening tools. These considerations reflect the characteristics of the instruments rather than comparative evidence of their effectiveness in Iranian clinical settings.

This review has several strengths. The search covered international and national databases, Google Scholar, grey literature, and reference lists, allowing a broad mapping of frailty instruments used in Iran. Separating studies that assessed instrument use from those

reporting local evidence reduced the risk of conflating frequency of use with the extent of local evaluation. By linking detailed instrument specifications, including domain coverage, item counts, scoring approach, and administration time, with observed patterns of use across Iranian community, hospital, and nursing-home settings, this review provides a practical reference that researchers and clinicians can use directly when selecting an instrument for a given context.

Several limitations should also be considered. Consistent with the scoping-review design, no formal assessment of methodological quality, risk of bias, or quality of evidence was performed; the findings should therefore be interpreted as a map of reported evidence rather than an evaluation of quality. Heterogeneity in instruments, populations, settings, outcomes, and assessment methods also limited direct comparison between instruments. In addition, the mapping of local evidence depended on the level of detail reported in the included studies. As Iran's older population continues to grow, having reliable, locally validated ways to assess frailty will matter more and more for both patient care and health-service planning. Filling the evidence gaps identified in this review, through validation studies for the instruments that are still unevaluated and through more rigorous comparative research, will help ensure that instrument choice in Iran is based on real local evidence rather than on habit or familiarity.

Conclusion

This scoping review mapped 13 frailty assessment instruments used among Iranian older adults and showed that physical frailty instruments, particularly the Fried Frailty Phenotype, are used more frequently than multidimensional instruments. No instrument was developed specifically for the Iranian older population, and four instruments, the FRAIL Scale, CFS, PRISMA-7, and FIFE, have not yet been evaluated in Iranian studies. As no instrument can be considered a local gold standard, instrument selection should be guided by the purpose of assessment, the domains of interest, and the target setting rather than by habit or familiarity. These findings offer researchers and clinicians a practical reference

for selecting frailty instruments in Iranian primary and community care, and highlight validation studies and broader geographic and clinical coverage as priorities for future research.

Relevance to clinical practice

Before this review, there was no single source clinicians or researchers in Iran could use to compare the frailty instruments already in use, or to know which ones had local psychometric evidence behind them and which did not. In practice, instrument choice has mostly depended on familiarity rather than documented evidence, and this review is a first attempt to bring that information together.

Importantly, because this review did not systematically evaluate implementation outcomes, diagnostic accuracy, feasibility, or comparative effectiveness, our findings do not provide a basis for recommending specific instruments for particular healthcare settings. Current instruments in Iran primarily differ in their conceptual design and administrative burden. For instance, brief screening tools (such as PRISMA-7 or FRAIL) reflect a minimal-burden approach suitable for rapid assessment, yet their diagnostic performance and cross-cultural validity remain unverified in Iran. Conversely, multidimensional instruments (such as the TFI or CFAI-Plus) are conceptually designed to capture psychological and social domains, but their practical utility in routine care requires further empirical evaluation rather than assumed superiority.

Another practical point is that almost all Iranian evidence comes from community-dwelling older adults, meaning nurses and clinicians in nursing homes and hospitals, where frailty is most common, currently have the least evidence to rely on. Consequently, extrapolating community-based evidence to acute and long-term care settings should be approached with caution until dedicated setting-specific validation studies are conducted.

Acknowledgments

The authors sincerely thank the Vice-Chancellor for Research and Technology at

Semnan University of Medical Sciences for their support of this research.

Conflict of interest

The authors state that they have no conflicts of interest.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of generative AI

During the preparation of this manuscript, the authors used Claude (Anthropic) to assist with language editing and grammatical refinement of the English text. The tool was not used for data analysis, interpretation of results, or generation of scientific content. The authors reviewed and edited all AI-assisted content and take full responsibility for the accuracy and integrity of the published work.

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Supplementary Tables

Table S1. Search strategy in Scopus database

Method	Keywords used in international databases
#1	(frailty OR "frailty syndrome" OR "frail elderly")
#2	(elderly OR aged OR "older adults" OR aging)
#3	(Iran OR Iranian OR Persian)
#4	#1 AND #2 AND #3

Search in TITLE-ABS-KEY

Table S2. Search strategy in Embase database

Method	Keywords used in international databases
#1	('frailty'/exp OR 'frail elderly'/exp OR frailty:ti,ab OR 'frailty syndrome':ti,ab OR 'frail elderly':ti,ab)
#2	('aged'/exp OR elderly:ti,ab OR 'older adults':ti,ab OR aging:ti,ab OR ageing:ti,ab)
#3	('iran'/exp OR iran:ti,ab OR iranian:ti,ab OR persian:ti,ab)
#4	#1 AND #2 AND #3

Table S3. Search strategy in Web of Science (WOS) database

Method	Keywords used in international databases
#1	(frailty OR "frailty syndrome" OR "frail elderly")
#2	(elderly OR aged OR "older adults" OR aging)
#3	(Iran OR Iranian OR Persian)
#4	#1 AND #2 AND #3

Search in topic

Table S4. Characteristics of the included studies and their primary contribution to the scoping review

No.	Author and year of publication	Study design	Study location	Population studied	Sample size	Tools	Primary contribution to the review
1	Tavan & Asadollahi (2021)	Cross-sectional	Shiraz	Community-dwelling older adults	249	(FFP)	Iranian validation study
2	Norouzi et al. (2024)	Retrospective Cohort	Nationwide	Nursing home residents	9199	(FFP)	Iranian validation study
3	Norouzi et al. (2025)	Retrospective Cohort	Khorasan Razavi	Nursing home residents	3554	(FFP)	Iranian validation study
4	Habibi Soola et al. (2026)	Cross-sectional	Ardabil hospitals	Older adults in the post-illness convalescence period, residing at home	505	(FFP)	Instrument-use mapping
5	Jafaripour et al. (2022)	Cross-sectional	Tehran	Community-dwelling older adults	508	(FFP)	Instrument-use mapping
6	Niksolat et al. (2022)	Cross-sectional	Rey City, Tehran	Patients attending Firoozabadi Hospital clinic	200	(FFP)	Instrument-use mapping
7	Shafiee et al. (2024)	Cross-sectional analysis of the cohort study	Bushehr	Community-dwelling older adults	2371	(FFP)	Instrument-use mapping
8	Vahidian et al. (2025)	Cross-sectional analysis of cohort study	Bushehr	Community-dwelling older adults	3000	(FFP)	Instrument-use mapping
9	Chehrehgosha et al. (2024)	Longitudinal	Birjand	Community-dwelling older adults	1246	(FFP)	Instrument-use mapping
10	Sharifi et al. (2021)	Cross-sectional analysis of the cohort study	Bushehr	Community-dwelling older adults	2336	(FFP)	Instrument-use mapping
11	Shamsalnia et al. (2024)	Cross-sectional analysis of cohort study	Amirkola, Mazandaran	Community-dwelling older adults	2018	(FFP)	Instrument-use mapping
12	Aryaie et al. (2022)	Longitudinal	Southern Iran	Older adults with a positive COVID-19 test	507	(FFP)	Instrument-use mapping
13	Rahimipour Anaraki et al. (2023)	Cross-sectional	Tehran	Postmenopausal women attending the outpatient clinic of Firoozabadi Hospital	272	(FFP)	Instrument-use mapping
14	Hayati et al. (2024)	Cross-sectional	Tehran	Community-dwelling older adults	161	(FFP)	Instrument-use mapping
15	Hayati et al. (2025)	Cross-sectional	Tehran	Community-dwelling older adults	161	(FFP)	Instrument-use mapping
16	Nejatifar et al. (2025)	Longitudinal	Qazvin	Patients with COPD attending a pulmonary clinic	140	(FFP)	Instrument-use mapping
17	Hashemi-	Cross-sectional	Lowlaman,	Community-dwelling older	140	(FFP)	Instrument-use

No.	Author and year of publication	Study design	Study location	Population studied	Sample size	Tools	Primary contribution to the review
	Bazargani (2022)		Rasht	adults covered by healthcare centers			mapping
18	Aghmashe et al. (2017)	Cross-sectional	Qazvin	Qazvin Retirees' Association members	250	(FFP)	Instrument-use mapping
19	Niksolat et al. (2025)	Cross-sectional	Tehran	Clinic-attending older adults	250	(FFP)	Instrument-use mapping
20	Hadadian et al. (2026)	Cross-sectional	Kashan	Hospitalized patients	300	(FFP)	Instrument-use mapping
21	Asadollahi et al. (2026)	Cross-sectional	Shiraz	Community-dwelling older adults	3000	(FFP)	Instrument-use mapping
22	Zarinfar et al. (2026)	Cross-sectional	Bushehr	Community-dwelling older adults	2367	(FFP)	Instrument-use mapping
23	Kazemi et al. (2026)	Cross-sectional	Kerman	Physically inactive community-dwelling older adults	107	(FFP)	Instrument-use mapping
24	Sheikholmolouki et al. (2025)	Cross-sectional analysis of cohort study	Birjand	Community-dwelling older adults	227	(FFP)	Instrument-use mapping
25	Asadi et al. (2022)	Cross-sectional	Ardabil	Older adults presenting to the emergency department	505	(FFP)	Instrument-use mapping
26	Hallajzadeh et al. (2026)	Cross-sectional	Maragheh	Community-dwelling older adults	368	(FFP)	Instrument-use mapping
27	Tavan et al. (2022)	Interventional	Shiraz	Community-dwelling older adults	54	(FFP)	Instrument-use mapping
28	Baneshi et al. (2023)	Cross-sectional	Bushehr	Community-dwelling older adults (attending an urban health service center)	215	(FFP)	Instrument-use mapping
29	Shamsalinia et al. (2024)	Cross-sectional analysis of cohort study	Amirkola, Mazandaran Province	Community-dwelling older adults	1000	(FFP)	Instrument-use mapping
30	Eslami et al. (2024)	Cross-sectional analysis of a longitudinal study	Birjand, Khorasan Province	Community-dwelling older adults	1364	(FI) (FFP)	Instrument-use mapping
31	Sobhani et al. (2022)	Cross-sectional analysis of cohort study	Birjand, Khorasan Province	Community-dwelling older adults from urban and rural areas	1529	(FFP) (FI)	Instrument-use mapping
32	Dorri et al. (2026)	Cross-sectional	Isfahan	Hospitalized older adults	500	(TFI)	Instrument-use mapping
33	Mazoochi et al. (2020)	Cross-sectional	Kashan	Community-dwelling older adults	175	(TFI)	Iranian validation study
34	Safarnavadeh et al. (2024)	Cross-sectional	Karaj	Community-dwelling older adults	400	(TFI)	
35	Jafarian Yazdi et al. (2022)	Cross-sectional	Tehran	Hospitalized older adults	120	(TFI)	Instrument-use mapping
36	Dadashi et al. (2026)	Cross-sectional	Tabriz	Retired older adults	210	(TFI)	Instrument-use mapping
37	Rangavar et al. (2025)	Cross-sectional	Kerman	Community-dwelling older adults	100	(TFI)	Instrument-use mapping
38	Gharib et al. (2025)	Cross-sectional	Sari	Community-dwelling older adults	368	(TFI)	Instrument-use mapping
39	Bordbar et al. (2025)	Cross-sectional	Southern Iran – Jiroft	Community-dwelling older adults	385	(TFI)	Instrument-use mapping
40	Nakhjiri et al. (2026)	Cross-sectional	Gilan	Hospitalized older adults	150	(TFI)	Instrument-use mapping
41	Rostamnia et al. (2025)	Cross-sectional	Tehran	Community-dwelling older adults	383	(TFI)	Instrument-use mapping
42	Seddighian et al. (2024)	Cross-sectional	Kashan	Community-dwelling older adults	644	(TFI)	Instrument-use mapping
43	Shohani et al. (2022)	Cross-sectional	Ilam	Hospitalized older adults	270	(TFI)	Instrument-use mapping
44	Zahed Nakhjiri et al. (2021)	Cross-sectional	Gilan	Patients in CCU and post-CCU units	125	(TFI)	Instrument-use mapping
45	Saeid et al. (2025)	Cross-sectional	Izeh, Khuzestan	Community-dwelling older adults	210	(TFI)	Instrument-use mapping
46	Nazari et al. (2023)	Cross-sectional	Tehran	Community-dwelling older adults	513	(TFI)	Instrument-use mapping
47	Ghorbanzadeh et al. (2025)	Cross-sectional	Babol, Mazandaran	Community-dwelling older adults	400	(TFI)	Instrument-use mapping
48	Mousavi Sisi et al. (2019)	Cross-sectional	Shabestar, West Azerbaijan	Rural older adults	565	(TFI)	Instrument-use mapping
49	Chehrehgosha et al. (2021)	Prospective study	Tehran	Older adults admitted to Ziaician Hospital	304	(FI-42)	Iranian validation study

No.	Author and year of publication	Study design	Study location	Population studied	Sample size	Tools	Primary contribution to the review
50	Saeidimehr et al. (2021)	Cross-sectional	Khuzestan	Community-dwelling older adults	540	(FI-40)	Instrument-use mapping
51	Ghasemi et al. (2019)	Cross-sectional	Tehran	Community-dwelling older adults	450	(FI-30)	Instrument-use mapping
52	Delbari et al. (2021)	Cross-sectional	5 cities in southern Iran	Community-dwelling older adults	540	(FI-70)	Instrument-use mapping
53	Rahimi Farahani et al. (2024)	Prospective cohort	Birjand	Community-dwelling older adults	1354	(FI-30)	Instrument-use mapping
54	Zarrin (2019)	observational cohort	Tehran	Shariati Hospital	240	(FI-24)	Instrument-use mapping
55	Bakhtiari et al. (2024)	Prospective cohort study	Tehran Heart Center	Patients aged undergoing coronary artery bypass grafting (CABG)	170	FRAIL (CFS)	Instrument-use mapping
56	Hosseini et al. (2025)	Cross-sectional	Amirkola	Community-dwelling older adults	1675	FRAIL	Instrument-use mapping
57	Bakhtiari et al. (2020)	Cross-sectional	Babol	Community-dwelling older adults	331	FRAIL	Instrument-use mapping
58	Ghanbarnia et al. (2024)	Cross-sectional	Amirkola	Community-dwelling older adults	1775	FRAIL	Instrument-use mapping
59	Talaei Boura et al. (2021)	Cross-sectional	Amirkola	Community-dwelling older adults	2010	FRAIL	Instrument-use mapping
60	Bakhtiari et al. (2026)	Cross-sectional	Babol	Community-dwelling older adults	250	FRAIL	Instrument-use mapping
61	Rahimi et al. (2025)	Cross-sectional	Isfahan	Retired older adults	258	(EFS)	Instrument-use mapping
62	Hosseini et al. (2023)	Cross-sectional	Mazandaran	Older adults on hemodialysis	194	(EFS)	Instrument-use mapping
63	Taghinejad et al. (2021)	Cross-sectional	Ilam	Older adults attending a hospital	267	(EFS)	Instrument-use mapping
64	Amrahi Tabieh et al. (2025)	Cross-sectional	Naqadeh	Community-dwelling older adults	347	(EFS)	Iranian validation study
65	Alaei et al. (2023)	Cross-sectional	Isfahan	Patients with heart failure	50	(EFS)	Iranian validation study
66	Dargahi et al. (2020)	Cross-sectional	Tehran	Nursing home residents	139	(GFI)	Iranian validation study
67	Vasiee et al. (2024)	Cross-sectional	Ilam	Hospitalized older adults	240	(GFI)	Instrument-use mapping
68	Nasrollahi et al. (2020)	Cross-sectional	Tehran	Older adults hospitalized at Hazrat-e Rasoul Hospital	300	(CFS)	Instrument-use mapping
69	Kojaie-Bidgoli et al. (2021)	Interventional	Kashan	Hospitalized older adults	195	(CFS)	Instrument-use mapping
70	Imani et al. (2021)	Cross-sectional	Shahrud	Community-dwelling older adults	340	(CFAI-Plus)	Iranian validation study
71	Imani et al. (2024)	Cross-sectional	Shahrud	Community-dwelling older adults	413	(CFAI-Plus)	Instrument-use mapping
72	Ziaeeefar et al. (2022)	Cross-sectional	Tehran	Community-dwelling older adults	550	(PRIS MA-7)	Instrument-use mapping
73	Zare et al. (2026)	Cross-sectional	Kashan	Community-dwelling older adults	250	(SFS)	Instrument-use mapping
74	Zare et al. (2024)	Cross-sectional	Kashan	Community-dwelling older adults	250	(SFS)	Iranian validation study
75	Chehrehgosha et al. (2021)	Cross-sectional	Tehran	Hospitalized older adults	304	(PFFS)	Iranian validation study
76	Yousefi et al. (2025)	Cross-sectional	Tehran	Community-dwelling older adults	214	(GFST)	Iranian validation study
77	Moradoghli et al. (2022)	Cross-sectional	Tehran	Community-dwelling older adults	200	(FIFE)	Instrument-use mapping

Note: Studies whose primary contribution to the review was the assessment of measurement properties or predictive validity are presented in bold. GFST = Gérontopôle Frailty Screening Tool; CFAI-Plus = Comprehensive Frailty Assessment Instrument-Plus; GFI = Groningen Frailty Indicator; TFI = Tilburg Frailty Indicator; FFP = Fried Frailty Phenotype; PFFS = Pictorial Fit-Frail Scale; EFS = Edmonton Frail Scale; SFS-8 = Social Frailty Scale-8; FI = Frailty Index.