

# FRAILTY ASSESSMENT SCALES FOR THE ELDERLY AND THEIR APPLICATION IN PRIMARY CARE: A SYSTEMATIC LITERATURE REVIEW

## OCENJEVALNE LESTVICE KRHKOSTI STAROSTNIKA IN NJIHOVA RABA NA PRIMARNI RAVNI: SISTEMATIČNI PREGLED LITERATURE

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### ABSTRACT

#### Keywords:

elderly, frailty, assessment scales, primary care

**Background:** The increase in the elderly population is causing changes and challenges that demand a comprehensive public health response. A specific characteristic of the elderly is their frailty. Today's problems with identifying levels of frailty are being resolved by numerous tools in the form of frailty assessment scales. This systematic review establishes which frailty assessment scales for the elderly are being used and what their applicability in primary care is like in Slovenia and around the world.

**Methods:** Documents published after 2010 were searched for in the PubMed database using keywords and other specific criteria.

**Results:** A total of 177 search hits were obtained based on various search strings. The final analysis included 28 articles, of which three were systematic literature reviews. These three covered quantitative studies, mainly consisting of observational cross-sectional surveys or cohort studies. Three other studies featured non-systematic literature reviews. Quantitative studies (mainly cross-sectional surveys or cohort studies) prevailed among the remaining 22 articles. One study had a qualitative design (Delphi method). The main outcome measures observed by all studies were frailty assessment scales for the elderly, the majority of which were evaluated on a sample of the elderly.

**Conclusions:** None of the assessment scales examined are used as the gold standard for primary care. A variety of tools are being used in clinical practice to assess frailty in elderly patients, highlighting the need for standardization and guidelines. This requires evaluating the current assessment scales in terms of validity and reliability, and suitably improving them.

### IZVLEČEK

#### Ključne besede:

starostniki, krhkost, ocenjevalne lestvice, primarno zdravstveno varstvo

**Uvod:** Povečan delež starejšega prebivalstva povzroča spremembe in prinaša izzive, kar zahteva celovit odziv na področju javnega zdravja. Specifičnost starostnikov je tudi njihova krhkost. Ta za posameznika pomeni večje tveganje za negativne rezultate, povezane z zdravjem. Ugotavljanje krhkosti daje teoretični okvir, v katerem lahko zdravnik primarnega zdravstvenega varstva oblikuje celovit pristop ocenjevanja in zdravljenja starejšega bolnika s kompleksno multimorbidnostjo na preprost in strukturiran način. Težave določanja stopnje krhkosti danes rešujejo številna orodja v obliki ocenjevalnih lestvic krhkosti. Slovenija se je v letu 2017 pridružila Evropski komisiji pri Skupnem evropskem ukrepanju za preprečevanje starostne krhkosti in oslabilosti »Joint Action«. Eden izmed predlogov ukrepov in aktivnosti je tudi razviti, implementirati in spremljati sistem presejanja na krhkosti po posameznih področjih. Sicer z merjenjem krhkosti lahko pridobimo uporabne podatke, a je za oblikovanje informacij pomemben izbor ustreznega, veljavnega instrumenta. Pojavlja se vprašanje o količini in kakovosti uporabe ocenjevalnih lestvic krhkosti starostnikov. Namen sistematičnega pregleda literature je ugotoviti, katere ocenjevalne lestvice merjenja krhkosti starostnika se uporabljajo in kakšna je domnevna uporabnost na primarni ravni v svetu in v Sloveniji.

**Metode:** Sistematično je bila pregledana literatura, objavljena po letu 2010, o ocenjevalnih lestvicah krhkosti starostnika. Iskanje dokumentov je potekalo v bibliografski bazi PubMed po določenih kriterijih s ključnimi besedami: frailty, elderly, evaluation scale, primary, frailty scale, frailty screening in primary care.

**Rezultati:** Vseh zadetkov glede na različne iskalne nize je bilo 177. V končno analizo se je uvrstilo 28 člankov, od tega trije sistematični pregledi literature. Ti vključujejo kvantitativne raziskave, v večini opazovalne presečne pregledne ali kohortne študije. Tri raziskave so nesistematični pregledi literature. Med 22 drugimi raziskavami prevladujejo raziskave s kvantitativnimi zasnovami, v večini so presečne pregledne ali kohortne študije. Ena študija ima kvantitativno zasnovo, zbiranje podatkov pa je potekalo z delfsko metodo. Opazovani izidi vseh študij so ocenjevalne lestvice starostnikov. V večini so jih raziskovalci vrednotili na vzorcu starostnikov.

**Zaključki:** Zaradi starajočega se prebivalstva je potreba po ureditvi področja merjenja krhkosti starostnikov s pomočjo ocenjevalnih lestvic vse večja. Za ugotavljanje krhkosti starejših se v praksi uporablja toliko orodij, da je potreba po standardizaciji in smernicah velika. Nobena izmed ocenjevalnih lestvic nima vloge zlatega standarda uporabe za primarno raven. Pred implementacijo v slovenski prostor je potrebno obstoječe ocenjevalne lestvice vrednotiti po kriterijih veljavnosti in zanesljivosti ter jih primerno izboljšati.

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## 1 INTRODUCTION

The population's age structure has been changing greatly over the past decades, with the population becoming increasingly older, including in Slovenia (1, 2). This causes many changes and challenges that demand a comprehensive public health response (3, 4).

A specific characteristic of the elderly is their frailty. It is defined as "a condition or syndrome which results from a multi-system reduction in reserve capacity to the extent that a number of physiological systems are close to, or past, the threshold of symptomatic clinical failure." As a consequence, the frail person is at increased risk of disability and death from minor external stresses (5). Identifying the level of frailty is a useful clinical concept for predicting and preventing frailty (6-8). Frailty in the elderly entails a changed perspective on age by replacing the outdated term "chronological age" with the more accurate and personalized parameter of "biological age," and it can be measured in individuals (9). Problems with identifying the level of frailty, which were common in the past (5), are now being solved by numerous tools that can also be applied to the elderly (10, 11).

Frailty assessment thus provides a theoretical framework that primary care physicians can use to develop a comprehensive approach to assessing and treating elderly patients with complex multimorbidity in a simple and structured way (7). In Slovenia, an important role in this regard is also played by family doctors and their teams (12). The importance of using frailty measurement tools is supported by the global lack of key information and evidence on the health of the elderly, which hinders the development and evaluation of suitable policies and programs for them (13). Frailty measurements can generally provide useful information, but that requires selecting an appropriate valid instrument (9). In agreement with the Ministry of Health, in 2017, Slovenia joined the EU Commission's Joint Action on the Prevention of Frailty. The main outcome of Joint Action will be a common European model to approach frailty, leading to the development of improved strategies for diagnosis care and education for frailty, disability and multi-morbidity. The Joint Action outcomes are expected to contribute to the prevention of the growing burden of disability and chronic diseases and to a more effective response to older people's needs of care delivery, a central priority for the EU and its MS. One of the measures and activities proposed was to develop, implement, and monitor a frailty screening system by individual area (14).

The question is how many frailty assessment scales are available and what their quality is like. In Slovenia, there is a need for the knowledge of frailty assessment scales for the application at the primary level. They established the subject of Geriatrics and subject Elderly, dying patient,

palliative at the Faculty of Medicine at the University of Ljubljana. In Slovenia, payment models for multimorbidity and elderly are also changing. This literature review identifies research on frailty assessment scales for the elderly published after 2010. Its goals were to determine which frailty assessment scales are available, what they measure, and whether they are used in primary care. The fundamental research question is whether the knowledge on frailty assessment scales provides a selection of assessment scales that could be applied to primary care in Slovenia in order to assess the frailty of the elderly.

## 2 METHODS

Literature on frailty assessment scales for the elderly was systematically reviewed. The data was collected in February 2018.

### 2.1 Document Sources

Documents were searched for in the online bibliographical database PubMed (15).

### 2.2 Document Identification Methods

Documents were searched for using the following keywords: frailty, elderly, evaluation scale, primary, frailty scale, frailty screening, and primary care. Searches were performed using Boolean operators for PubMed: (((frailty) AND elderly) AND evaluation scale); (((frailty) AND elderly) AND rating scale); (((frailty) AND elderly) AND measuring); ((frailty) AND screening) AND primary care). The search was limited to full-text open-access English articles published after 2010.

### 2.3 Methods of Selecting Documents to be Included in the Analysis

The selection in PubMed was narrowed down to full-text research articles. The keywords selected had to be included in the article's title or abstract, the articles had to refer to the elderly, and they had to be written in English and published in the past 8 years. An article was deemed appropriate if it featured a study connected with the frailty assessment scales used for the elderly. Studies containing clinical frailty scales or scales used for populations other than the elderly and clinical frailty scales were not included. After selecting the relevant articles, an open discussion took place in a heterogeneous group of experts with diplomas from the Faculty of Medicine and Faculty of Health Sciences at the University of Ljubljana and head lecturer of subject Determinants of health and disease on Interdisciplinary doctoral programme in Biomedicine, field Public Health. Another discussion took place in a group of students specialized in Family Medicine from Faculty of Medicine at the subject

Elderly, dying patient, palliative. Their suggestions and comments found a place in the final selection of articles and frailty assessment scales for eventual application in primary care.

## 2.4 Selection of Relevant Data for the Systematic Review

The data collected included year, country, research design, units observed, number of participants, and main conclusions.

## 2.5 Methods for Assessing Study Quality

The suitability of the studies included was evaluated in terms of their agreement with the search string.

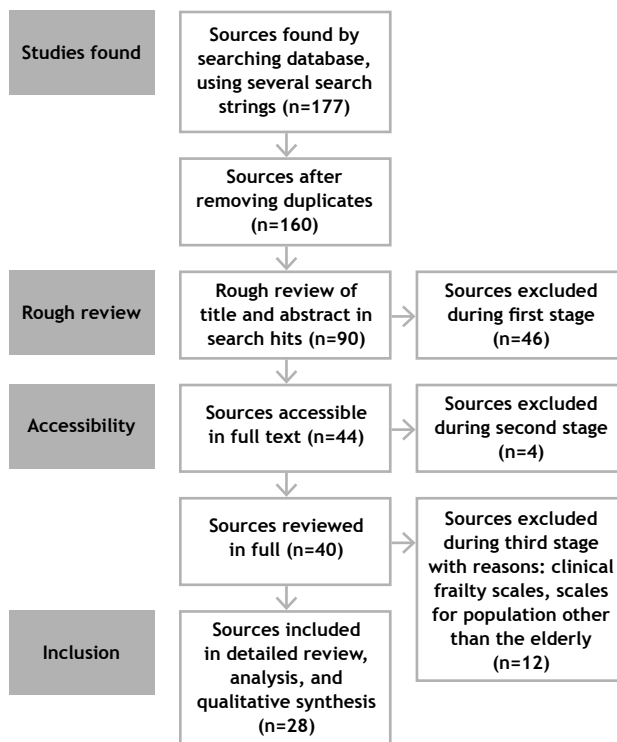
## 3 RESULTS

Twenty-eight articles meeting the criteria set were selected for final analysis (Table 1).

### 3.2 Main Characteristics of the Research Studies Reviewed

This analysis includes three systematic literature reviews that together cover more than 70 quantitative studies, consisting largely of observational cross-sectional surveys or cohort studies. Three studies included in the final analysis are non-systematic literature reviews (Table 1).

### 3.1 Selecting Documents for Systematic Review



**Figure 1.** The procedure of selecting documents for inclusion in the systematic review of literature on frailty assessment scales for the elderly and their application in primary care.

**Table 1.** Main characteristics and results on frailty assessment scales for the elderly.

Document	Country	No. of studies included in final analysis	Research design	Year studies were conducted	Main conclusions
Bouillon et al., 2013 (16)	UK	27	Quantitative design: mostly cross-sectional studies	1948 -2011	Twenty-seven frailty scales were identified, but their reliability and validity were rarely evaluated. None of them are used as the gold standard.
Vermeulen et al., 2011 (17)	Netherlands	28	Quantitative design: longitudinal and cohort studies	1975 -2010	The strongest predictors are low physical activity and slow walking speed.
Drubbel et al., 2014 (18)	Netherlands	20	Quantitative design: one cross-sectional survey and 19 cohort studies	2001 -2012	The Frailty Index (FI) is a valid instrument for assessing frailty.
Li et al., 2017 (19)	Canada	Non-systematic literature review	51 references	Not provided	Measuring the grades of frailty in the elderly could assist in the assessment, management, and decision-making for osteoporosis and osteoporotic fractures.
Singh et al., 2014 (20)	US	Non-systematic literature review	101 references	Not provided	There are numerous frailty assessment scales available.
Dawson and Dennison, 2016 (21)	New Zealand	Non-systematic literature review	36 references	Not provided	At present, while diagnostic tools have been developed to identify those with the condition (e.g. the PRISMA 7 questionnaire), as there are many conditions which frailty mimics, the problem of low specificity remains.

Twenty-two studies from various countries, published after 2010, are dominated by quantitative, mostly cross-sectional or cohort studies. One study (22) has a qualitative design and data for it was collected using the Delphi method. The number of subjects included in the study depends on the research design, ranging from 100 to 5,000 in the majority of the studies; the age criteria

used vary. Four studies include geriatric specialists: GPs, specialist physicians, and so on (22-25). Four studies (26-29) are based on databases that already exist. The main outcome measures observed by all studies are frailty assessment scales, indexes, or indicators analysed from various perspectives (Table 2).

**Table 2.** Main characteristics and results on frailty assessment scales for the elderly.

Document	Country	Research design	No. of participants / characteristics	Main outcome measures	Main conclusions
Roppolo et al., 2015 (30)	Italy	Quantitative design: cross-sectional study	267 community-dwelling elderly people	The Cardiovascular Health Study index and the Tilburg Frailty Indicator	Different instruments capture different frail individuals.
Malmstrom et al., 2015 (31)	USA	Quantitative design: longitudinal cohort study	998 Afro-Americans, 49 to 65 years old	How well the International Academy of Nutrition and Aging (FRAIL) frailty scale predicts future disability compared to the Study of Osteoporotic Fractures (SOF) frailty scale, the phenotype-based Cardiovascular Health Study (CHS) frailty scale, and the comprehensive Frailty Index (FI)	Combined use of instruments proves to be the best for predicting disability and mortality.
Romero-Ortuno et al., 2010 (26)	Ireland	Quantitative design: cross-sectional survey	17.304 women and 13.811 men over 50 included in the Survey of Health, Aging and Retirement in Europe (SHARE)	The authors created and validated a simple frailty screening instrument.	The SHARE Frailty Instrument has sufficient construct and predictive validity.
Romero-Ortuno and Soraghan, 2014 (27)	Ireland	Quantitative design: longitudinal population-based study	4.001 women and 3.057 men 75 or older from the Survey of Health, Aging and Retirement in Europe (SHARE)	The mortality prediction of the SHARE-FI75+ was compared with that of previous frailty scales in SHARE (SHARE-FI, 70-item index, phenotype, FRAIL).	The SHARE-FI75+ could help identify frailty in primary care.
Jotheeswaran et al., 2016 (32)	India	Quantitative design: cross-sectional survey, group-based observational study, measurement instrument validation	150 frail and/or care-dependent elderly people in the primary care setting	Three primary care physicians administered EASY-Care comprehensive geriatric assessment.	Robust measurement properties.
Uchmanowicz et al., 2014 (33)	Poland	Quantitative design: cross-sectional survey, measurement instrument validation	100 Polish patients 42 men and 58 women	The aim was to adopt and test the validity of the Polish version of the TFI	The TFI is a valid and reproducible instrument for assessing frailty among the Polish population.
van Kempen et al., 2013 (34)	Netherlands	Quantitative design: observational pilot study, cross-sectional survey	seven academic GP practices in and around Nijmegen, the Netherlands; a total of 151 patients were included	The aim was to describe the development of the Easycare-TOS.	The instrument meets the efficiency, flexibility, and acceptability requirements for use in primary care.

Document	Country	Research design	No. of participants / characteristics	Main outcome measures	Main conclusions
Morris et al., 2016 (28)	US	Quantitative design: cross-sectional survey, measurement instrument development, and evaluation	464.788 people served by home care agencies	The aim was to present the development and evaluation of the interRAI HC Frailty Scale.	The instrument is based on a strong conceptual foundation.
van Kempen, et al., 2015 (23)	Netherlands	Quantitative design: cross-sectional, explorative observational study	six family practices and one geriatric department; 587 patients 70 or older registered in these practices	The aim was to compare the frailty assessments provided by family physicians and geriatricians.	Geriatricians assess patients as frail more often than family physicians.
Morley et al., 2013 (22)	US	Qualitative design: the Delphi method	delegates of six major international, European, and US societies, and seven other frailty specialists	The aim was to reach consensus on frailty.	A report was produced based on the consensus.
Castell et al., 2013 (35)	Spain	Quantitative design: cross-sectional study	1.327 people older than 65	The aim was to estimate frailty based on the walking speed of the elderly urban population and apply the findings to primary care.	Detection of a walking speed below 0.8 m/s is a simple approach to diagnosing frailty in primary care.
Eyigor et al., 2015 (36)	US	Quantitative design: cross-sectional multicentre study	1.126 people over 65 from 13 centres	The Fried frailty criteria, the Mini Nutritional Assessment, the Centre for Epidemiological Studies Depression (CES-D) scale, the Charlson Comorbidity Index	Age, female gender, low education level, being a housewife, living with the family, being sedentary, presence of an additional disease, using four or more drugs/day, avoiding going outside, at least one visit to any emergency department within the past year, hospitalization within the past year, non-functional ambulation, and malnutrition increase the risk of frailty.
Drubbel et al., 2013 (37)	Netherlands	Quantitative design: cross-sectional observational study	1.580 patients 60 or older from a Dutch primary care centre	Whether a Frailty Index (FI), based on ICD-coded primary care data, and the Groningen Frailty Indicator (GFI) questionnaire identify the same older people as frail.	The FI and the GFI moderately overlap in identifying frailty. Authors suggest an initial FI screening in routine healthcare data, followed by a GFI questionnaire for patients at high risk as the preferred two-step frailty screening process in primary care.
Silva et al., 2016 (38)	Brazil	Quantitative design: cross-sectional observational study	345 elderly people	Self-perceived health, anamnesis, Lawton and Brody's Scale, Katz Index, Geriatric Depression Scale, Timed Up and Go Test, and Study of Osteoporotic Fracture Index	Risk of falls, frailty, functional performance on the Instrumental Activities of Daily Living, insomnia, and familial support are related to self-perceived health.
Bertoli et al., 2017 (39)	Italy	Quantitative design: cross-sectional observational study	112 elderly subjects: 62 were hospitalised following hip fracture and 50 control subjects were outpatients	Thyroid stimulating hormone (TSH), free triiodothyronine (FT3), and free thyroxine (FT4) were measured to evaluate the prevalence of thyroid hormone modifications in elderly frail subjects and its relationship with frailty.	Measuring FT3 can be a useful laboratory parameter.

Document	Country	Research design	No. of participants / characteristics	Main outcome measures	Main conclusions
Theou et al., 2015 (40)	Ireland	Quantitative design: longitudinal study	4.961 elderly Irish residents	Whether frailty assessment differs when constructing frailty indices using solely self-reported or test-based health measures.	Self-reported and test-based measures should be combined when trying to identify levels of frailty.
van Kempen et al., 2015 (24)	Netherlands	Quantitative design: longitudinal primary care registry-based cohort study	4.961 elderly Irish residents a 587 patients of four GP practices in the Netherlands	The aim was to determine the predictive value of EASY-Care TOS for negative health outcomes within the year from assessment.	GPs can predict negative health outcomes in their older populations efficiently and almost as accurately as specialists in this area.
Bruyère et al., 2017 (25)	Belgium, EU survey	Quantitative design: international online cross-sectional survey	388 clinicians from 44 countries, mostly doctors (93%), with geriatrics as their primary field of practice (83%).	How practitioners measure the geriatric syndrome of frailty in their daily routine.	52.8% always assess frailty in their daily practice and 64.9% of them diagnose frailty using more than one instrument.
Metzelthin et al., 2010 (41)	Netherlands	Quantitative design: cross-sectional survey	687 community-dwelling elderly people 70 or older.	The Groningen Frailty Indicator (GFI), the Tilburg Frailty Indicator (TFI), the Sherbrooke Postal Questionnaire (SPQ), and the Groningen Activity Restriction Scale (GARS)	The GFI and the TFI showed high internal consistency and construct validity in contrast to the SPQ. It is not yet possible to conclude whether the GFI or the TFI should be preferred. The SPQ seems less appropriate for postal screening of frailty.
Lee et al., 2017 (42)	Canada	Quantitative design: retrospective chart review	Complete frailty screening data were available for 383 patients 75 and older.	The aim was to examine the accuracy of individual Fried frailty phenotype measures in identifying the Fried frailty phenotype in primary care.	The use of gait speed or grip strength alone was found to be sensitive and specific as a proxy for the Fried frailty phenotype, but the use of both measures together was found to be accurate, precise, specific, and more sensitive than other possible combinations. Assessing both measures is feasible within primary care.
Campitelli et al., 2016 (29)	Canada	Quantitative design: retrospective cohort study	resident Assessment Instrument (RAI) data for all long-stay home care clients (66 or older) in Ontario, Canada (n=234.552)	The aim was to examine two versions of a frailty index (a full and a modified FI), and the CHESS scale, and compare their baseline characteristics and their predictive accuracy.	The different approaches to detecting vulnerability resulted in different estimates of frailty prevalence. The gains in predictive accuracy were often modest with the exception of the full FI.
Vergara et al., 2016 (43)	Spain	Quantitative design: prospective multicentre cohort study	900 individuals 70 or older	The Tilburg Frailty Indicator (TFI), the Gérontopôle Frailty Screening Tool (GFST), and the KoS model together with two biomarker levels (SOX2 and p16INK4a) for adverse events related to frailty.	Great potential for direct application in primary care.

**Table 3.** Frailty assessment scales that were identified for eventual application in primary care.

Frailty assessment scale	Short description
The FRAIL (22)	fatigue, resistance, aerobic, illnesses, loss of weight
The Cardiovascular Health Study Frailty Screening Measure (22)	weight loss, exhaustion, low activity, slowness, weakness
The SHARE Frailty Instrument (SHARE-FI) (26)	exhaustion, weight loss, handgrip strength, slowness, low activity
The SHARE Frailty Instrument (SHARE-FI) 75+ (27)	fatigue, low appetite, weakness, slowness.
interRAI home care frailty scale (28)	29 assessment items; the areas of function, movement, cognition and communication, social life, nutrition and clinical symptoms
Study of Osteoporotic Fractures (SOF) frailty scale (31)	weight loss, reduced energy level, inability to rise from a chair, reduced energy level
Tilburg Frailty Indicator (TFI) (33, 41, 43)	Sociodemographic characteristics of a participant. The physical domain: physical health, unexplained weight loss, difficulty in walking, balance, hearing problems, vision problems, strength in hands, and physical tiredness. The psychological domain: cognition, depressive symptoms, anxiety, and coping. The social domain: living alone, social relations, and social support
easycare Two-step Older persons Screening (Easycare-TOS) (24, 34)	14 questions about the functioning of the patient in somatic, psychological, and social domains
Frailty Index (FI) (37)	includes 40 variable
Groningen Frailty Indicator (GFI) (25, 37, 41)	15 self-report items and screens for loss of functions and resources in four domains: physical, cognitive, social, and psychological
Short Physical performance Battery (SPPB) (25)	balance, 4-metre gait speed and chair stand test
Edmonton frail scale (25)	cognitive impairment, health attitudes, social support, medication use, nutrition, mood, continence, functional abilities
Frail scale status (25)	fatigue, resistance, ambulation, illness and loss of weight
Gerontopole frailty screening tool (GFST) (22, 25, 43)	The first 6 questions evaluate the patient's status (living alone, involuntary weight loss, fatigue, mobility difficulties, memory problems and gait speed), whereas the last two assess the general practitioner's personal view about the frailty status of the individual and the patient's willingness to be referred to the Frailty Clinical for further evaluation.
SEGA grid (25)	functional decline, including age, provenance, drugs, mood, perceived health, history of falls, nutrition, comorbidities, IADL, mobility, continence, feeding and cognitive functions
Strawbridge questionnaire (25)	two or more functional domains (physical, cognitive, sensory and nutritive).
Frailty phenotype (25, 44)	unintentional weight loss (10 lbs in past year), self-reported exhaustion, weakness (grip strength), slow walking speed, and low physical activity

## 4 DISCUSSION

### 4.1 Systematic Review Results

Considering that frailty is a common feature of the elderly, it is also important to obtain information on this area. Veninšek and Gabrovec (45) identified four main areas essential for the clinical management of frailty: definition of frailty, epidemiology of frailty, tools for screening and diagnosis frailty and successful interventions for decreasing frailty. The priority objective of the WHO Global Strategy and Action Plan on Aging and Health (13) to fill information gaps at the global level is thus well

grounded. This is also confirmed by the results of this systematic review. The international survey conducted by Bruyère et al. (25), which included 44 countries, shows that frailty assessment is becoming a routine daily practice in treating elderly patients. According to this study, 205 (52.8%) clinicians, of whom the majority are geriatric specialists, always assess frailty in their daily practice and 38.1% report measuring it sometimes (25). All international consensus groups recommended all persons older than 70 years should be screened for frailty (22).

Factors, such as age and malnutrition, increase the risk of frailty (36), but individual deviations may be great, and the level of frailty may vary. Physical frailty in the elderly is a complex condition and the musculoskeletal aging phenotype comprises four key elements: osteoporosis, osteoarthritis, sarcopenia, and frailty (21). On the other hand, measuring the grades of frailty in the elderly can assist in assessment, management, and decision-making for osteoporosis and osteoporotic fractures (19). Fried et al. (44) proposed five frailty criteria: weakness, slow walking speed, low physical activity, self-reported exhaustion, and unintentional weight loss. The majority of physicians (64.9%) generally measure and diagnose frailty using more than one instrument (25). The most widely used tool is the gait speed test, which is performed by 43.8% of physicians (25) and is a simple yet efficient indicator for diagnosing frailty in primary care (17). This is followed by the clinical frailty scale (34.3%), the SPPB test (30.2%), the frailty phenotype test (26.8%), and the frailty index (16.8%) (25). Examples of some commonly used and validated frailty tools include the FRAIL, the Cardiovascular Health Study Frailty Screening Measure, the Clinical Frailty Scale, and the Gérontopôle Frailty Screening Tool (22). The Phenotype of Frailty is the most evaluated and frequently-used measure (16). The results of ADVANTAGE JA research (46) showed that there are multiple measurements used to screen and diagnose frailty. They have considered the most relevant, the recommended tools of frailty would be: Clinical Frailty Scale, Edmonton Frailty Scale, FRAIL Index, frailty phenotype, Inter-Frail, Prisma-7, Sherbrooke Postal Questionnaire, Short Physical performance Battery (SPPB), Study of Osteoporotic Fractures Index (SOF) and gait speed.

Other researchers (16, 20, 43) report a great variety of frailty scales, but their reliability and validity have rarely been examined (16). Bouillon et al. (16) highlight that only a few studies have evaluated frailty scales in terms of reliability and validity or following specific standards. An acceptable reliability coefficient and predictive validity has been confirmed for the CSHA Clinical Frailty Scale and the Edmonton Frail Scale. The frailty index and the Fried scale have been tested for validity, but not reliability (16). Specific anomalies (terminological and professional anomalies or plagiarism) occur with many assessment scales (16).

The majority of studies positively conclude that the scales examined are efficient for identifying the level of frailty (18, 26-28, 31, 32-34, 37, 42). Other studies determine that different instruments result in different estimates of frailty and that the gains in the tests' predictive accuracy are often modest (29, 30). The level of frailty assessed by geriatricians and GPs may differ (23, 24). Among other things, frailty can also be related to self-perceived health (38).

Bruyère et al. (25) report that a variety of tools are being used, highlighting the need for standardization and guidelines. None of the assessment scales are used as the gold standard in primary care (18, 27, 34, 42, 43). Widely used scales - a good example of which is the frailty scales developed by Fried et al. (44) - must be based on strict criteria. In addition, improvements and consensus of everyone involved in the healthcare for the elderly are required (16).

#### 4.2 Research Limitations and Strengths

Conclusions can be drawn regarding the possible application of existing scales in Slovenia. It would make sense to expand the literature review by including search strings that also identify psychological frailty (e.g. "mental" frailty scales). This is the first review of literature which investigates frailty scales for use at primary level and in terms of reliability and validity.

#### 4.3 Relevance of the Systematic Review Results for the Discipline

This systematic review provides insight into which frailty assessments scales are used for the elderly, who assesses frailty of the elderly, and the importance of primary care in assessing elderly people's frailty.

#### 4.4 Potential for Further Research

There is a need for more research that assesses the validity, reliability, user-friendliness, comparability, etc., of different frailty scales.

### 5 CONCLUSION

Due to population ageing, there is an increasingly greater need for standardizing the measurement of geriatric frailty using frailty assessment scales. According to the situation (resource constraints) we estimate that the most appropriate scales for primary care in Slovenia are Frailty phenotype (44), Short Physical performance Battery (SPPB) (25) and Edmonton frail scale (25). Implementing such scales in Slovenia requires further research and discussions by leading specialists in this area on extended professional college of doctors of family medicine. Also, nurses from modal practices should be included. Consensus between various healthcare levels should be reached.

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## CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

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## ETHICAL APPROVAL

The method used in this systematic review involves no ethical issues and therefore no ethical approval was necessary.

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