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CURRENT EVIDENCE ON FRAILTY IN OLDER ADULTS: A LITERATURE REVIEW

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Abstract

Relevance. Frailty is a common geriatric syndrome associated with decreased functional capacity and a high risk of adverse outcomes. According to studies, its prevalence among individuals aged 50 years and older averages 17.4 %, while pre-frailty prevalence reaches 49.3 %. In the Republic of Kazakhstan, the issue of frailty remains insufficiently studied despite the growing proportion of older adults and the high prevalence of chronic diseases.

Objective: analysis of current data on frailty in older adults.

Materials and Methods. A review of the scientific literature on the prevalence, risk factors, and diagnostic methods of frailty in older adults was conducted. The search was performed in the databases PubMed, Scopus, Web of Science, and Google Scholar for the period 2010-2025. Articles in Russian and English focusing on frailty in older adults were included; irrelevant and duplicate publications were excluded.

Results. Frailty is a syndrome with a staged and dynamic course. Three stages are distinguished: robust, pre-frailty, and frailty. The prevalence of the syndrome varies from 10 % to 24 % depending on the population, reaching about 20 % in Asian countries and decreasing to 7-8 % in some countries. Pre-frailty is more common and may reach 40-50 %. The highest prevalence is observed among individuals with multimorbidity and in low- and middle-income countries. The main risk factors include advanced age, multimorbidity, low physical activity, poor nutrition, cognitive impairment, and social isolation.

Conclusions. Frailty is a common and clinically significant syndrome that has a substantial impact on the health and quality of life of older adults. The high variability in prevalence and the multifactorial nature of its development require a comprehensive approach to diagnosis and prevention.

***Keywords**: frailty, older adults, prevalence, risk factors, diagnosis.*

Introduction

In the context of an aging global population, issues related to maintaining the health of older adults are becoming increasingly relevant. One of the most significant challenges in this age group is the decline in physical functioning, which reduces quality of life and increases dependence on outside assistance. Geriatric syndromes play a significant role in the development of functional limitations, with frailty occupying a special place among them [1]. Frailty is a common and significant geriatric syndrome characterized by an age-related decline in physiological reserves and impaired function of various organs and systems [2]. Frailty is considered to be very common in older adults and is associated with a high risk of falls, disability, hospitalization, and mortality [3].

A meta-analysis by Siriwardhana and colleagues, involving people aged 50 and older from 15 countries, found an overall prevalence of physical frailty of 17.4 %, ranging from 3.9 % to 51.4 %. The prevalence of pre-frailty was 49.3 %, ranging from 13.4 % to 71.6 % [4]. The study's results also showed that the prevalence of frailty among community-dwelling older adults is higher in middle-income countries compared to high-income

countries. Population aging is a global phenomenon observed not only in high-income countries. In low- and middle-income countries, life expectancy is also increasing, which is linked to the development of healthcare systems. At the same time, the rate of demographic aging in the Commonwealth of Independent States exceeds that of economically developed countries. This trend places an additional burden on developing economies, as they must simultaneously address health care, social support, and social security challenges associated with the aging population [5].

In the Republic of Kazakhstan, frailty has not been sufficiently studied, but existing research indicates significant factors contributing to its prevalence. It has been found that older adults experience a decline in functional independence, a high need for medical and social assistance, and an increased risk of falls [6]. At the same time, chronic noncommunicable diseases account for a large share of the disease burden, and they are an important factor in the development of frailty [7]. Given the growing proportion of the elderly population and the limited research in this area, frailty is a significant issue in Kazakhstan.

Materials and methods

We conducted a review of the scientific literature on the prevalence, risk factors, and diagnostic methods for frailty in older adults. The literature search was conducted between April and May 2026 in the international scientific databases PubMed, Scopus, Web of Science, and Google Scholar. The analysis included articles published between 2010 and 2025.

The following keywords and their combinations were used for the search: «*frailty*», «*elderly*», «*older adults*», «*prevalence*», «*risk factors*», «*geriatric syndrome*», «*aging*», «*multimorbidity*», «*sarcopenia*», «*social frailty*». The search strategy combined keywords using Boolean operators (AND, OR). The following search combinations were applied: («frailty» OR «frailty syndrome») AND («older adults» OR elderly OR aging); («frailty») AND prevalence; («frailty») AND «risk factors»; and («frailty») AND diagnosis.

Inclusion criteria were: publications in Russian and English; articles published between 2010 and 2025; studies on geriatric asthenia; data on prevalence and/or risk factors; original studies, systematic reviews, and meta-analyses; and the inclusion of older adults in the study. Exclusion criteria included publications published before 2010, duplicate studies, articles without full text, works lacking quantitative or analytical data, publications not relevant to the study topic, and studies involving exclusively young adults.

Results

Frailty is considered a syndrome because it has a multifactorial nature, manifests as a cluster of symptoms, and is associated with impaired function in several body systems [8].

Three main stages are distinguished in the progression of frailty: the normal state (robust), pre-frailty, and frailty. Pre-frailty is an intermediate and potentially reversible condition, whereas established frailty is characterized by a marked decline in the body's functional capacity and increased dependence on outside assistance [9]. At the prefrailty stage, the first clinical signs appear, such as weakness and fatigue. Established frailty is associated with a marked decline in physical activity, slowed gait, reduced muscle strength, and increased vulnerability to adverse effects. Consequently, the risk of falls, hospitalization, and other complications increases [10].

Frailty is considered a multifactorial syndrome, assessed using a phenotypic model and a deficit accumulation model. The progression of this condition occurs in stages and includes the prefrailty and overt frailty phases. Clinically, the syndrome manifests as weakness, fatigue, and reduced physical activity. It is important to note that frailty is a dynamic condition that can progress and partially regress [11].

A key feature of frailty is its difficulty in diagnosis. Fierro-Marrero et al. (2025) noted the absence of a unified standard for assessing this syndrome, as well as the existence of various diagnostic tools based on different conceptual approaches. Furthermore, frailty shares similar manifestations with other geriatric conditions, such as sarcopenia, cognitive impairment, and disability, which complicates its differential diagnosis and reduces the accuracy of the prognosis [12].

The Frailty Index is based on the concept of cumulative deficits. Within this framework, frailty is viewed as the cumulative impact of multiple impairments, including symptoms, chronic diseases, and functional and cognitive changes. The index is calculated as the ratio of identified deficits to their

total number and serves as a continuous measure of frailty severity [13].

The phenotypic model of frailty includes 5 criteria: weakness, fatigue, reduced activity, slowed gait, and weight loss; the presence of three of these criteria indicates a diagnosis of geriatric asthenia, while 1-2 indicate a predisposition [14].

The clinical scale for frailty is a simple clinical scale (1-9) based on an assessment of the patient's functional status and level of independence; it has high prognostic significance but is partially dependent on subjective assessment [15]. Individuals with frailty typically report a low subjective assessment of their health status, which may indicate a decline in the body's functional capabilities [16]. The assessment yields a total score ranging from 1 (good condition) to 9 (terminal stage), reflecting the severity of the syndrome [17].

One of the simplest tools for screening frailty is the FRAIL scale, a questionnaire comprising five components: fatigue, resistance (ability to climb stairs), ambulation (mobility), illnesses (chronic conditions), and loss of body weight (loss of weight). Based on the total score, conditions are classified as normal, pre-asthenia, or asthenia. This scale allows for the rapid identification of individuals at increased risk of adverse outcomes, including disability, reduced functional status, and mortality [18].

For a clear comparison of methods for diagnosing senile asthenia, their main characteristics are summarized in Table 1.

Table 1. Main models for diagnosing frailty

Model	Valuation principle	Main components	Points/score	Advantages and limitations
FRAIL scale [12]	Questionnaire (self-assessment)	Fatigue, climbing stairs, walking, medical conditions, weight loss	0-5 points	Easy and quick to use; no equipment required; may be subjective
Clinical Frailty Scale [13]	Clinical judgment	Functional status, cognitive impairment, dependence	Levels 1-9	A quick assessment, widely used in clinical practice, depends on the physician's experience.
Fried phenotype [14]	Physical Assessment	Weight loss, weakness, fatigue, walking speed, activity level	0-5 criteria	A more objective assessment requires measurements to be taken
Frailty Index [15-18]	Accumulation of deficits	Symptoms, diseases, and functional disorders	Index (0-1)	High accuracy, computational complexity, and labor intensity

Source: compiled by the authors on the basis of [12-18]

Prevalence of geriatric asthenia. According to a systematic review by Collard et al., which includes studies from high-income countries, the prevalence of frailty among community-dwelling older adults averages approximately 10 % [19].

According to a systematic review and meta-analysis by O'Caoimh R et al. (2021), frailty is widespread among the elderly population worldwide. Its prevalence ranges from 12 % to 24 %, but varies widely depending on the diagnostic criteria and population characteristics used. A higher prevalence of the syndrome is observed in low- and middle-income countries. Furthermore, the prevalence of frailty increases with age and is more common in women [20].

According to a study by To T-L et al., the prevalence of frailty among older adults in Asian countries averages 20 %. Thus, approximately 1 in 5 older adults in this region exhibits signs of frailty [21]. At the same time, the prevalence of the syndrome varies significantly depending on living conditions. It has been noted that among older adults living in rural areas, the prevalence of frailty is about 17-18 %, while the prevalence of pre-frailty exceeds 40 % [22].

In some Asian countries, prevalence rates are similar. For example, in Indonesia, the prevalence of frailty among the elderly population is approximately 16-20 % [23]. A large-scale international study by Pitter et al. (2024) across 42 Eu-

ropean countries found a significant prevalence of frailty among the elderly population. It was found that the incidence of this syndrome increases substantially with age, particularly in older age groups. At the same time, frailty is more commonly diagnosed in women than in men. There are marked cross-national differences, with higher prevalence rates characteristic of Eastern and Southern European countries, whereas in Northern European countries they are lower, reflecting the influence of socioeconomic and demographic factors [24].

At the same time, rates may be lower in some countries. For example, a nationally representative study by Murayama et al. found that the prevalence of frailty among the elderly population in Japan is approximately 7-8 %, which is lower than in several other countries [25].

The presence of multimorbidity in older adults is particularly significant. A systematic review and meta-analysis by Cai et al. found that the prevalence of frailty among individuals with multiple chronic conditions is approximately 18 %, whereas the prevalence of pre-frailty reaches 45-50 %. This indicates a significant influence of multimorbidity on the development and progression of this syndrome [26]. Table 2 presents data on the prevalence of frailty from various studies.

Table 2. Prevalence of frailty in various populations

№	Source	Region / Population	Prevalence of asthenia	Pre-asthenia	Features
1	Collard RM et al., 2012 [19]	International (primarily developed countries)	**10,7 %** (4,0-59,1 %)	**41,6 %** (35,0-73,9 %)	Older adults living in the community
2	O'Caoimh R et al., 2021[20]	62 countries (worldwide)	12-24 %	~40 %+	It depends on the evaluation method
3	To T-L et al., 2022 [21]	Asia	20,5 %	-	One in five older adults
4	Xu R et al., 2021 [22]	Rural areas	17-18 %	>40 %	Higher in rural populations
5	Pradana AA et al.,2023 [23]	Indonesia	**16–20 %** (3-40 %+)	40-50 %	Significant variability
6	Pitter JG et al., 2024 [24]	Europe (42 countries)	**12–15 %** (on average)	-	5-25 %+ across countries
7	Murayama H et al., 2020 [25]	Japan	7-8 %	40-45 %	Lower than in other countries
8	Cai S et al.,2025 [26]	Comorbidity	18 %	45-50 %	High risk in cases of chronic diseases

Source: compiled by the authors on the basis of [19-26]

Risk factors for geriatric asthenia. Frailty is a multifactorial syndrome (Table 3). A systematic review by Deng et al. (2025) showed that the main risk factors include advanced age, female gender, multimorbidity, low physical activity, malnutrition, cognitive impairment, and social isolation. It was found that early identification and correction of these factors can slow the progression of the syndrome [27]. Wang's meta-analysis confirmed the role of many modifiable factors, including a low body mass index, lack of physical activity, vitamin D deficiency, smoking, depression, and chronic diseases [28].

Boucham et al. (2024) note that these factors are well established, supported by numerous systematic reviews and meta-analyses. Additionally, important risk factors include frequent hospitalizations and a decline in functional independence among older adults [29].

Social factors are particularly important. Social isolation, loneliness, low income, and low education are associated with an increased risk of developing geriatric asthenia. Social vulnerability is considered an important component of the overall syndrome and may contribute to the development of physical and cognitive decline [30].

According to current understanding, senile frailty develops from the accumulation of various developmental abnormalities and a decline in the body's physiological reserves. Individual risk factors do not act in isolation but reinforce one another. All of this leads to an exacerbation of the syndrome [31].

Older adults receiving home care require special attention. The study showed that this group has a higher risk of developing frailty associated with reduced mobility, functional dependence, chronic diseases, malnutrition, and depression. The study also noted that frailty is closely linked to increased demand for medical and social assistance [32].

It should be noted that senile frailty is considered a multidimensional syndrome, as the severity and prevalence of this condition depend on the living conditions of older adults, and it is higher among those who are highly dependent and in need of care. The various components of frailty are interrelated and reinforce one another [33].

Table 3. Classification of key determinants contributing to the development of frailty syndrome

Key determinants	Examples
Biological	advanced age, sarcopenia, hormonal changes
Medical	cardiovascular disease, diabetes, cognitive impairment
Social	social isolation, low income
Behavioral	physical inactivity, malnutrition
Pharmacological	polypharmacy

Source: compiled by the authors on the basis of [12-18]

Discussion

The findings are consistent with those of other studies, which have shown significant differences in frailty prevalence across populations and living conditions [34; 35].

According to studies, this syndrome is associated with an increased risk of adverse outcomes, including disability and mortality, and should be taken into account when making clinical decisions [36; 37].

The considerable variation in the reported prevalence of frailty across different countries may be explained by differences in demographic characteristics, socioeconomic conditions, healthcare systems, and the assessment instruments used. Studies applying the Fried Frailty Phenotype often report different prevalence estimates compared with those using the Frailty Index or the Clinical Frailty Scale, highlighting the need for standardized diagnostic approaches [8; 13; 20; 24].

The findings of this review emphasize the importance of early identification of frailty in primary healthcare. Routine screening of older adults may facilitate timely interventions, including physical activity programs, nutritional support, and comprehensive geriatric assessment, which have been shown to delay frailty progression and improve functional outcomes. Integrating frailty assessment into routine clinical practice may therefore contribute to healthier ageing and reduce healthcare utilization [1; 10; 29; 43].

In recent years, understanding of this syndrome has expanded to include not only physical but also cognitive components. In particular, the literature describes a condition combining physical weakness and cognitive impairment. All of the above data underscore the complexity of the syndrome's structure and its impact on prognosis [38-40]

Despite significant progress in the study of geriatric asthenia, some limitations remain. The lack of a single definition and the use of multiple diagnostic tools lead to significant variability in results and make comparison difficult [41; 42]. At the same time, frailty is viewed as a promising area of modern geriatrics and offers new opportunities to improve the quality of medical care for elderly patients [43-45].

The increasing ageing of the population worldwide makes frailty an important public health challenge. Given the absence of a universally accepted diagnostic standard, further high-quality prospective studies are needed to improve the comparability of research findings and support the development of evidence-based prevention and management strategies [3,8,41,43].

Limitations. This review is limited by the heterogeneity of the included studies regarding study design, populations, and frailty assessment

methods. However, the available evidence allows for a comprehensive overview of current knowledge on frailty in older adults.

Conclusion

Frailty is a complex syndrome caused by the interaction of biological, medical, and social factors. This condition requires further study due to the significant diversity of its manifestations and the lack of a standardized diagnostic method. The development of effective strategies for early detection and prevention of frailty is becoming increasingly important, particularly in aging populations.

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ЕГДЕ ЖАСТАҒЫ АДАМДАРДАҒЫ ҚАРТТЫҚ АСТЕНИЯ ТУРАЛЫ ЗАМАНАУИ КӨЗҚАРАСТАР: ӘДЕБИЕТКЕ ШОЛУ

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Аңдатпа

Өзектілігі. Қарттық астения – функционалдық мүмкіндіктердің төмендеуімен және жағымсыз салдардың жоғары қаупімен сипатталатын кең таралған гериатриялық синдром. Зерттеулерге сәйкес, 50 жастан асқан адамдар арасында оның таралуы орта есеппен 17.4 % құрайды, ал предастения 49.3 %-ға дейін жетеді. Қазақстан Республикасында кәрілік астения мәселесі қарт адамдар үлесінің артуына және созылмалы аурулардың жоғары таралуына қарамастан жеткілікті деңгейде зерттелмеген.

Мақсаты: қарт адамдардағы кәрілік астениясы туралы заманауи деректерді талдау.

Материалдар мен әдістер. Қарт адамдардағы кәрілік астениясының таралуы, қауіп факторлары және диагностика әдістері бойынша ғылыми әдебиеттерге талдау жүргізілді. Іздеу PubMed, Scopus, Web of Science және Google Scholar деректер базаларында 2010-2025 жылдар аралығында жүргізілді. Қарт адамдардағы кәрілік астениясына арналған орыс және ағылшын тілдеріндегі мақалалар енгізілді; тақырыпқа сәйкес келмейтін және қайталанатын жарияланымдар алынып тасталды.

Нәтижелер. Қарттық астения – сатылы және динамикалық ағыммен сипатталатын синдром. Оның үш кезеңі бар: қалыпты жағдай, предастения және айқын астения. Синдромның таралуы популяцияға байланысты 10 %-дан 24 %-ға дейін өзгеріп, Азия елдерінде шамамен 20 %-ға жетеді, ал кейбір елдерде 7-8 %-ға дейін төмендейді. Предастения жиі кездеседі және 40-50 %-ға дейін жетуі мүмкін. Ең жоғары таралу мультиморбидтілігі бар адамдарда және табысы төмен және орташа елдерде байқалады. Негізгі қауіп факторларына егде жас, мультиморбидтілік, төмен физикалық белсенділік, жеткіліксіз тамақтану, когнитивтік бұзылыстар және әлеуметтік оқшаулану жатады

Қорытынды. Қарттық астения - қарт адамдардың денсаулығы мен өмір сапасына айтарлықтай әсер ететін кең таралған және клиникалық маңызды синдром. Оның таралуының жоғары өзгермелілігі мен көпфакторлы табиғаты диагностика мен алдын алуға кешенді тәсілді талап етеді.

***Түйін сөздер**: кәрілік астениясы, қарт адамдар, таралуы, қауіп факторлары, диагностика.*

СОВРЕМЕННЫЕ ПРЕДСТАВЛЕНИЯ О СТАРЧЕСКОЙ АСТЕНИИ У ПОЖИЛЫХ ЛЮДЕЙ: ОБЗОР ЛИТЕРАТУРЫ

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Аннотация

Актуальность. Старческая астения является распространенным гериатрическим синдромом, который ассоциирован со снижением функциональных возможностей и высоким риском неблагоприятных исходов. По данным исследований, её распространенность среди лиц старше 50 лет со-

ставляет в среднем 17.4 %, тогда как пред-астения достигает 49.3 %. В Республике Казахстан проблема старческой астении остается недостаточно изученной, несмотря на рост доли пожилого населения и высокую распространенность хронических заболеваний.

Цель: анализ современных данных о старческой астении у пожилых людей.

Материалы и методы. Проведен анализ научной литературы по распространенности, факторам риска и диагностике старческой астении. Поиск выполнен в базах PubMed, Scopus, Web of Science и Google Scholar за 2010-2025 гг. Включены статьи на русском и английском языках, посвященные старческой астении у пожилых, исключены нерелевантные и дублирующие публикации.

Результаты. Старческая астения – представляет собой синдром со стадийным и динамическим течением. Выделяют три стадии: нормальное состояние, пред-астению и выраженную астению. Было выявлено, что распространенность синдрома варьируется от 10 % до 24 % в зависимости от популяции, достигая около 20 % в странах Азии и снижалась до 7-8 % в отдельных странах. Пред-астения встречается значительно чаще и может достигать 40-50 %. Наибольшая распространенность отмечается у лиц, с мультиморбидностью и в странах с низким и средним уровнем дохода. К основным факторам риска относятся пожилой возраст, мультиморбидность, низкая физическая активность, недостаточное питание, когнитивные нарушения и социальная изоляция.

Выводы. Старческая астения является распространенным и клинически значимым синдромом, который оказывает существенное влияние на здоровье и качество жизни пожилых людей. Высокая вариабельность распространенности и многофакторный характер развития требует комплексного подхода к диагностике и профилактике.

Ключевые слова*: *старческая астения, пожилые люди, распространенность, факторы риска, диагностика.

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