Pregledni znanstveni članek / Review article

Management of frailty at individual level – Frailty prevention: narrative literature review from the perspective of the European Joint Action on frailty – ADVANTAGE JA

Management krhkosti na ravni posameznika – Preventiva pred krhkostjo: pregled literature z vidika projekta skupnega ukrepanja – ADVANTAGE JA

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ABSTRACT

Introduction: Frailty is a geriatric syndrome characterized by a diminished physiological reserve of multiple organs, which leads to greater risks of adverse outcomes in the elderly. As the process which leads to frailty can be decelerated or even completely reversed, early prevention interventions are crucial. The purpose of the study was to present the results of a narrative literature review and data analysis on prevention of frailty at the individual level.

Methods: A literature search was conducted in the following databases: PubMed, Cochrane, Embase, CINAHL and UpToDate. The criterion applied in literature search was that articles were published from 2002 to 2017. From 391,910 initial hits, 30 publications were selected.

Results: Early diagnosis of frailty and functional decline are considered effective measures against age-related comorbidities. Interventions have a significant impact on preventing the progression of frailty and the negative consequences of frailty. Lifestyle, including physical activity (particularly resistance exercise) and nutrition (higher protein intake and vitamin D supplement), is a good measure for preventing disorders associated with age.

Discussion and conclusion: Targeted interventions have a significant modifiable influence on frailty prevention. Frailty management and early intervention require a comprehensive and multidisciplinary approach including clinical management with physical activity, diet and medicine.

IZVLEČEK

Uvod: Krhkost je geriatrični sindrom in se kaže kot rezultat podpražnega zmanjšanja zmogljivosti številnih fizioloških sistemov, ki vodi v stanje visokega tveganja za neugodne zdravstvene izide. Ker se lahko proces, ki vodi do starostne krhkosti in oslabljenosti, upočasni ali celo popolnoma zavre, so zgodnje intervencije in morebitno zdravljenje ključnega pomena. Namen raziskave je bil predstaviti rezultate pregleda literature in analize podatkov preventive pred krhkostjo na ravni posameznika.

Metode: Za to raziskavo je bil izveden pregled literature v naslednjih bazah: PubMed, Cochrane, Embase, CINAHL in UpToDate. Vključitveni kriterij je bil izbor literature, objavljene v zadnjih petnajstih letih, od leta 2002 do leta 2017. Od 391.910 zadetkov je bilo izbranih 30 publikacij.

Rezultati: Zgodnje odkrivanje krhkosti in telesnega upada veljata za učinkovito ukrepanje proti s starostjo povezano komorbidnostjo. Intervencije imajo pomemben vpliv na preventivo, napredovanje krhkosti in tveganje za neugodne zdravstvene izide. Med pomembne in učinkovite preventivne ukrepe sodi življenjski slog z vključeno telesno aktivnostjo (vztrajnostna vadba) in prehrano (večji vnos beljakovin in dodajanje vitamina D).

Diskusija in zaključek: Ciljne intervencije imajo pomemben vpliv na preventivo pred krhkostjo. Upravljanje s krhkostjo in zgodnje intervencije zahtevajo širok in multidisciplinaren pristop, kar vključuje klinično obravnavo s telesno aktivnostjo, prehrano in zdravili.

Introduction

Ageing involves a physiological decline, which compromises the response to abrupt changes in health. Consequently, old people are more susceptible to diseases such as cancer, diabetes, cognitive decline or Parkinson's disease, which is particularly prevalent (Carretero, et al., 2015). Thus, a new challenge of how to overcome the above mentioned conditions and improve a patient's quality of life has arisen (Carretero, et al., 2015).

Frailty is a progressive age-related decline in physiological systems that results in decreased reserves of intrinsic capacity, which confers extreme vulnerability to stressors and increases the risk of a range of adverse health outcomes (World Health Organization, 2015). It can be viewed as poor resilience since it increases an individual's vulnerability to disproportionate changes in the health status and associated increased dependency and/or mortality when exposed to a stressor (Clegg, 2013). It has been recognized that frailty may have a biological basis, with a physical, social and psychological component (Uchmanowicz, et al., 2015), but a standardized definition has not yet been established. Not only physical and cognitive status, but also depression, anxiety and loneliness may be signs of frailty. Depending on the definition selected, the prevalence of frailty oscillates from 4 % to 17 % among community-dwelling adults aged 65 and older (Collard, et al., 2012). Lifestyle and other interventions may help offset the toll of ageing.

Aims and objectives

The purpose of this study was to present the results of a narrative literature review and data analysis focusing on the prevention of frailty in the context of managing frailty at an individual level.

Methods

Descriptive research methodology was used to review peer-reviewed literature. A narrative literature review was conducted because it enables the gathering of data from various sources and ensures a holistic understanding of the research subject.

Review methods

The literature search was conducted using the following databases: PubMed, The Cochrane Library, Embase, UpToDate, Cumulative Index of Nursing and Allied Health Literature (CINAHL), by means of several combinations of selected search words in the English language and their synonyms were prepared and used with Boolean operators: Functional Decline*() OR Frailty *() OR Frail *() OR Vulnerable *() OR disability *() OR Elderly *() OR Aged *() OR Older*() OR Adult *() OR Older Person *() OR Older Adult Function *() OR Geriatric*() OR Prevention Health Promotion*() OR Geriatric Programmes*() OR Screening Tools*() OR Family Carer's*() OR Risks*() OR Social Determinants*() OR Strategies*(); searching in the title, key words and abstract.

Key words were selected from proposed key words that were prepared by the task leader and the work group focusing on Prevention as part of the European Commission project "Joint Action on Frailty prevention – JA ADVANTAGE", Work Package 6 – Management of Frailty at Individual Level. The selection criterion for articles to be included in the review was that they were published during the last 15 years, i.e. between 2002 and 2017. The inclusion criteria were based on scientific facts, contextual relevance and full-text availability. Articles regarding current policies and guidelines on frailty prevention in older people which were published in peer-reviewed scientific journals were considered. Information from editorials, letters, interviews, posters and articles with no access to full text were not included in the study. The process of the literature review is displayed in the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) diagram (Moher, et al., 2009) as shown in Figure 1.

The results of the review

The total number of all search results was 391,910. After excluding duplicates and taking inclusion criteria into account, a total of 30 articles/sources remained for analysis (Table 1).

The quality assessment of the review and description of data processing

With our approach, we found papers of different levels of research evidence (Polit & Beck, 2017). Between the selected papers of different levels of research evidence we included 9 qualitative works of research, 15 quantitative and 6 literature reviews (Table 1). Data synthesis was conducted using the descriptive method.

Results

Studies that were selected and described are listed in Table 1.

Observation of risk indicators for prevention or early recognition of frailty

In an observational cross-sectional study Serra-Prat and colleagues (2016) identified the main social, clinical and analytical factors associated with frailty. 170 men and 154 women were recruited (mean age 80.1 years). Frailty was associated with age, female
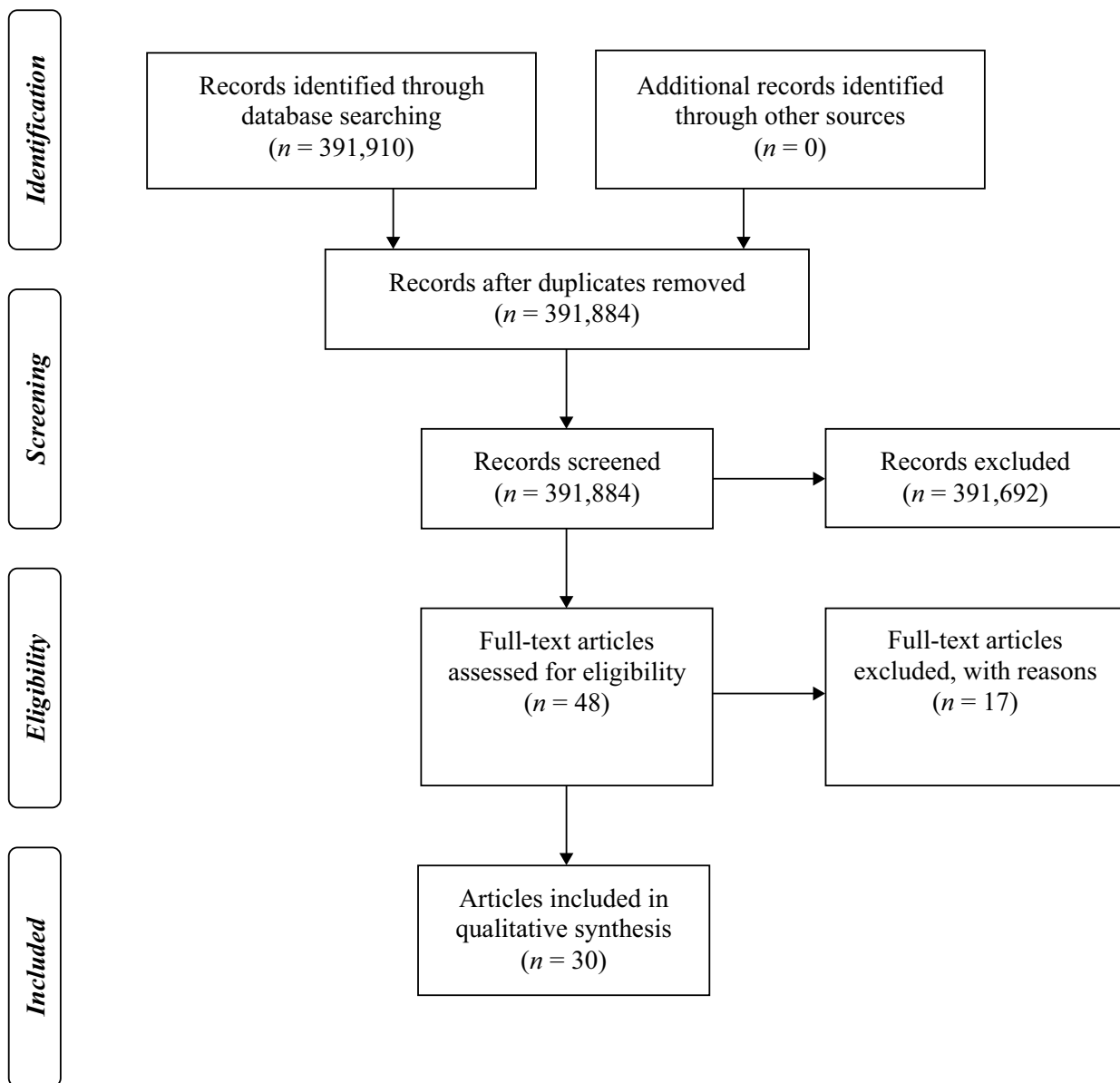
Figure 1: *Information flow through different phases of systematic review (PRISMA diagram)*
Slika 1: *Diagram poteka raziskave skozi faze sistematičnega pregleda literature (diagram PRISMA)*

gender, education level, certain comorbidities, geriatric syndromes, previous falls, pain, number of medications, anorexia, nutritional status, physical activity, muscle mass, obesity, anaemia, kidney function and C-reactive protein. Results showed that good control over underlying diseases and pain, rationalizing the use of medications, optimizing nutritional status and body weight, promoting physical activity and improving social support may contribute to preventing or even reverting frailty. In the research conducted by Lee and colleagues (2016) the prevalence of frailty was significantly associated with age in women but not in men, living relatives nor a caregiver or in a group setting.

Similar findings were obtained by Guessous and colleagues (2014). The number of frailty indicators was positively associated with age, hypertension, and current smoking and negatively associated with male gender, body mass index, waist-to-hip ratio, and serum total cholesterol level. Lower income level but not education was associated with a higher number of frailty indicators (Guessous, et al., 2014). Mello and colleagues (2014) identified the socio-demographic, psycho-behavioural, health-related, nutritional, and lifestyle factors associated with frailty in the elderly. Knowledge of the complexity of determinants of frailty can assist the formulation of measures for prevention and early intervention, thereby contributing to a better quality of life for the elderly and greater dignity.

Table 1: *Description of studies included in the literature review*
Tabela 1: *Opis publikacij, ki so bile vključene v pregled literature*

Author / Avtor	Country / Država	Research aim / Namen raziskave	Study type / Tipologija raziskave	Sample / Vzorec	Key findings / Ključne ugotovitve
Kono, et al., 2016	Japan	To explore the impact of preventive home visits on functional status of ambulatory frail elderly individuals.	Single-blind randomized controlled trial	360 ambulatory frail elderly individuals	Preventive three-monthly home visits program is preventive for functional status of ambulatory frail elderly individuals.
Serra-Prat, et al., 2016	Spain	To explore social, clinical and analytical factors associated with frailty.	Cross-sectional study	324 community-dwelling individuals, aged 75+ years	Good control over underlying diseases and pain, rationalizing use of medications, optimizing nutritional status and body weight, promoting physical activity and improving social support may contribute to preventing or even reverting frailty.
Lee, et al., 2016	United States of America	To explore the use of phenotypic definition (with modifications) of frailty.	Population-based longitudinal study	824 participants, 90+ years Study	Understanding frailty in individuals aged 90 and older will help elucidate risk factors and potential interventions to reduce frailty and adverse health outcomes and ultimately, reduce costs for the care of these individuals.
Vermeulen, et al., 2011	/	To explore the physical frailty indicators on ADL (Activities of Daily Living) disability in community-dwelling elderly people.	Systematic literature review	28 longitudinal cohort studies	Slow speed and low physical activity/exercise seem to be the most powerful predictors followed by weight loss, lower extremity function, balance, muscle strength, and other indicators.
Fougère, et al., 2017	France	To explore the care model, which uses a specialist nurse trained in primary care and geriatric assessment.	Observational quantitative research	200 patients, 70+ years	This care model with a geriatric evaluation nurse in primary care, who is specialized in the evaluation of frailty and cognitive functions, could be an interesting option to develop geriatric assessment in all territories.
Mello, et al., 2014	/	To identify the socio-demographic, psycho-behavioural, health-related, nutritional, and lifestyle factors associated with frailty in the elderly.	Systematic literature review	35 studies, mainly cross-sectional	The main factors associated with frailty were: age, female gender, black race/colour, schooling, income, cardiovascular diseases, number of comorbidities/diseases functional incapacity, poor self-rated health, depressive symptoms, cognitive function, body mass index, smoking, and alcohol use.
Ilinca & Calciolar, 2015	10 European countries	To explore frailty and its implications for health systems.	Observational study	83,019 observations from 50,967 individuals	General practitioners might be key partners to implement successful initiatives aimed at targeting frail patients.
Mohandas, et al., 2011	/	To explore current and future directions in frailty research.	Detailed literature review	42 sources	Areas of future research are: attributes that can be used to define frailty, conceptualization of frailty, measurement issues, comparison of models related to frailty, methods to improve clinical trial, design for the measurement of frailty.
Buttery, et al., 2015	Germany	To explore frailty associations with sociodemographic, social support and health characteristics.	Cross-sectional analysis	1843 community-dwelling people aged 65–79 years	Other relevant targets for specific frailty detection and intervention studies relate to socioeconomic status, social support, depressive symptoms, cognition, falls, polypharmacy and poor hearing.
Vernerey, et al., 2016	France	To explore construct and validate a new frailty-screening instrument named Frailty Groupe Iso-Ressource Evaluation (FRAGIRE).	Prospective multicentre study - Instrument development	385 older people, 60+ years	The FRAGIRE instrument that accurately predicts the risk for frailty in older adults seems to have considerable potential as a reliable and effective tool for identifying frail elderly individuals.

Continues / Se nadaljuje

Author / Avtor	Country / Država	Research aim / Namen raziskave	Study type / Tipologija raziskave	Sample / Vzorec	Key findings / Ključne ugotovitve
Van Kempen, et al., 2015	Netherlands	To explore EASY-Care Two step Older people Screening (EASY-Care TOS) tool.	Random sampling	587 patients from four general practitioners practices	EASY-Care TOS tool is a stepped approach to identify frail older people at risk for negative health outcomes in primary care. EASY-Care TOS meets the needs of primary care professionals, and has been shown to be feasible for use in primary care.
At, et al., 2015	India	To explore The COPE (Caring for Older PEople) multidimensional assessment tool.	Cohort study	150 of older people	The COPE assessment is a useful tool for identifying specific impairments linked to needs for home care and support.
Carretero, et al., 2015	/	To implement new strategies to improve the prevention and early diagnosis of frailty.	Revised literature and the web of the EC	98 sources	Lifestyle, including physical activity and diet, is one good measure for preventing the disorders associated with age.
Morris, et al., 2016	United States of America	To develop and evaluate a Home Care Frailty Scale.	Secondary analysis design	464,788 assessments	The Home Care Frailty Scale will have wide applicability to support program planning and policy decision-making impacting home care clients and their formal and informal caregivers throughout the world.
Coelho, et al., 2015a	Portugal	To analyze which determinants predict frailty in general and each frailty domain.	Cross-sectional study	252 community-dwelling elderly	The adverse effects of polymedication and its direct link with the level of comorbidities could explain the independent contribution of the amount of prescribed drugs to frailty prediction.
O'Caoimh, et al., 2014	Ireland	To investigate the prevalence of frailty-associated risk factors and their distribution according to the severity of perceived risk.	Cohort study	Cohort of 803 community dwelling older adults	Frailty, cognitive impairment and functional status were markers of perceived risk.
Drubbel, et al., 2014	Netherlands	To better identify frailty in daily clinical practice by using the frailty index.	Systematic review	20 studies	The frailty index showed a good criterion and construct validity but lacked studies on responsiveness.
Gu, et al., 2016	China	Study aims at investigating whether socioeconomic status (SES) moderates the association between frailty and mortality.	Survey	A large nationally representative, 13,731 adults aged 65	Public health programs aimed at improving SES and promoting healthy longevity should start early in the old age, or even earlier, and target poor and frail older adults for maximum impact.
Campitelli, et al., 2016	Canada	To determine the prevalence and correlates of frailty (as operationally defined by three measures) in a home care cohort.	Retrospective cohort study	234,552 clients, 66 + years	All three measures were significant predictors of the health outcomes examined, the gains in predictive accuracy were often modest with the exception of the full frailty index in predicting long term care admission.
Op het Veld, et al., 2015	Netherlands	To describe the levels of social, psychological and physical functioning according to Fried's frailty stages.	Cross-sectional study	8,684 community-dwelling older people (65+)	Study indicated that the Fried frailty criteria could help health care professionals to identify and treat frail older people in an efficient way, and provide indications for problems in other domains.

Author / Avtor	Country / Država	Research aim / Namen raziskave	Study type / Tipologija raziskave	Sample / Vzorec	Key findings / Ključne ugotovitve
Falsarella, et al., 2015	Brasil	To investigate the association between body composition and frailty.	Cross-sectional study	235 elderly (65+)	Frailty in the elderly was characterized by a body composition profile/ phenotype with lower muscle mass and lower bone mass and with a higher fat %.
Sheehan, et al., 2013	Ireland	To investigate the relationships between Body Mass Index (BMI), frailty and falls.	Cohort study	606 community dwelling adults, 60+ years	It was found that those with an increased BMI were more likely to present as frail and less likely to fall.
Bouillon, et al., 2013	United Kingdom	To provide a comprehensive catalogue of current frailty measures.	Literature review	27 original articles frailty scales	27 measures of frailty were recognised but none of them have been recognized as a gold standard.
Macklai, et al., 2013	11 European countries	To test the validity of the Survey of Health, Ageing and Retirement in Europe (SHARE) operationalized frailty phenotype.	Observational study	11,015 community-dwelling men and women aged 60+	SHARE, with its wide-scope and detail prospective data on individual, economic, social, and environmental and health characteristics, is the ideal medium to further epidemiological research on frailty and health in Europe.
Woo, et al., 2005	China	To test the relationship between socioeconomic factors, lifestyle, social support network, and the frailty index.	Cohort study	2,032 people, aged (70+)	Frailty index, developed for elderly Canadians (Rockwood et al., 2002) and shown to be valid for an elderly Chinese population, is influenced by social and environmental factors in keeping with the concept of frailty being multi-dimensional.
Woo, et al., 2015	China	To measure frailty prevalence and contributory factors across three populations.	Cohort study	4,851 people (65+)	The use of frailty index as a public health indicator has advantages in monitoring trends in changes of frailty with time.
Young, et al., 2016	United Kingdom	To investigate contribution of genetic and environmental factors to frailty.	Analysis	3,375 volunteer adult twins - 40.0–84.5 years old.	Frailty is both genetically and environmentally determined.
Coelho, et al., 2015b	Portugal	To compare how physical, psychological and social frailty predict the outcomes.	Longitudinal study	95 community dwelling elderly	There are benefits in using multidimensional frailty measures, the physical components of frailty seem to have greater importance for the prediction of adverse outcomes.
Guessous, et al., 2014	Switzerland	To determine the prevalence of frailty indicators among middle-aged and older adults.	Population based cross sectional study	2,930 aged 50 (+)	The number of frailty indicators was positively associated with age, hypertension, and current smoking and negatively associated with male gender, body mass index, waist-to-hip ratio, and serum total cholesterol level. Lower income level, universal health insurance coverage, household income were associated with higher number of frailty indicators.
Bleijenberg, et al., 2012	Netherlands	To describe the development process of the Innovative tructured and proactive primary care program (U-CARE) to allow its replication.	Feasibility study	52 participants (General practitioners, Registered nurses)	The general practitioners and the registered practice nurses indicated that the U-CARE intervention is feasible in clinical practice.

Coelho and colleagues (2015a) analysed which determinants predict frailty in general and each frailty domain (physical, psychological, and social), considering the integral conceptual model of frailty and particularly to examine the contribution of medication in this prediction. The Tilburg Frailty Indicator was used. A significant proportion of frailty was predicted by life course determinants and by comorbidity.

Falsarella and colleagues (2015) investigated the association between body composition (BC) and frailty, and identified BC profiles in nonfrail, prefrail, and frail elderly people. Frailty in the elderly was characterized by a BC profile/phenotype with lower muscle mass and lower bone mass and with a higher fat percentage. BMI did not represent an effective instrument to determine the relationship between BC and frailty. Sheehan and colleagues (2013) investigated the relationships between BMI, frailty and falls. An increase in BMI contributed significantly to the identification of frail older adults. A total of 346 falls by 148 participants were reported at follow up. Those with an increased BMI were significantly less likely to have experienced a fall between baseline and follow up assessments. Young and colleagues (2016) investigated the contribution of genetic and environmental factors to frailty. Study results indicate that frailty is both genetically and environmentally determined.

Instruments for diagnosing and measuring frailty

A detailed literature review was performed by Mohandas and colleagues (2011) to identify key dimensions and models currently being used to define frailty, classify interventions that have been developed to reverse frailty, and identify potential areas for future research within this field. Despite the large body of research defining the dimensions of frailty, no consensus exists on a comprehensive, operational definition. A standardized definition will be critical to design effective interventions at earlier stages along the continuum of frailty and interpret findings from evaluation studies. Bouillon and colleagues (2013) carried out a literature review to: provide a comprehensive catalogue of current frailty measures; evaluate their reliability and validity; and report on their popularity of use. There are numerous frailty scales currently in use although their reliability and validity have rarely been examined.

Macklai and colleagues (2013) tested the validity of the SHARE operationalized frailty phenotype. The SHARE-operationalized frailty phenotype is significantly associated with all the tested health outcomes independent of baseline morbidity and disability in community-dwelling men and women aged 60 and older living in Europe. The findings indicate that even after adjusting for age, sex, income and baseline disability or morbidity, frailty persisted to be independently associated with developing mobility, Instrumental Activities of Daily Living (IADL) and Basic Activities of Daily Living (BADL) disability over a 2-year follow up. Vernerey and colleagues (2016) constructed and validated a new frailty-screening instrument named Frailty Groupe Iso-Ressource Evaluation (FRAGIRE). The FRAGIRE instrument that accurately predicts the risk for frailty in older adults seems to have considerable potential as a reliable and effective tool for identifying frail elderly individuals by a public health social worker without medical training. Van Kempen and colleagues (2015) explored the EASY-Care Two step Older people Screening (EASY-Care TOS) tool, which is a stepped approach to identify frail older people at risk for negative health outcomes in primary care and makes use of general practitioners' readily-available information.

The objective of the study conducted by Coelho and colleagues (2015) was to compare how different frailty measures (Frailty Phenotype/FP, Groningen Frailty Indicator/GFI and Tilburg Frailty Indicator/TFI) predict short-term adverse outcomes. The effect of the FP on the outcomes was not significant when compared with the other measures. However, when comparing TFI's domains, the physical domain was the most significant predictor of the outcomes, even explaining part of the variance of ADL disability. At and colleagues (2015) investigated the COPE (Caring for Older People) multidimensional assessment tool, which is designed to help community health workers to identify clinically significant impairments and deliver evidence-based interventions. The COPE assessment is a useful tool for identifying specific impairments linked to the needs of home care and support.

Morris and colleagues (2016) developed and evaluated the Home Care Frailty Scale and provided a grounded basis for assessing a person's risk for decline that included functional and cognitive health, social deficits and troubling diagnostic and clinical conditions. O'Caoimh and colleagues (2014) investigated the prevalence of frailty-associated risk factors and their distribution according to the severity of perceived risk in a cohort of community dwelling older adults, using the Risk Instrument for Screening in the Community (RISC).

Based on the literature review Drubbel and colleagues (2014) concluded that due to the complex care needs of frail older people, general practitioners must be capable of easily identifying frailty in daily clinical practice, for example, by using the frailty index. Campitelli and colleagues (2016) determined the prevalence and correlates of frailty (as operationally defined by three measures) in a home care cohort, the agreement between these measures, and their predictive validity for several outcomes assessed over one year. They examined two versions of a frailty index, a full and modified Frailty Index, and the Changes in Health, End-stage disease and Signs and Symptoms scale

(CHESS), compared their baseline characteristics and their predictive accuracy for death, long-term care admission, and hospitalization endpoints in models adjusted for age, sex and comorbidity. Research from Woo and colleagues 2005 showed that frailty index is influenced by social and environmental factors in keeping with the concept of frailty being multi-dimensional. Such a quantitative measure may be a useful indicator of the health of the elderly populations as well as for public health measures to combat frailty. Op het Veld and colleagues (2015) described the levels of social, psychological and physical functioning according to Fried's frailty stages by using a large cohort of Dutch community-dwelling older people. There were statistical differences between three Fried's frailty stages and in the level of social, psychological and physical functioning between the non-frail, pre-frail and frail persons.

Activities in professional service for prevention of frailty

Kono and colleagues (2016) conducted a single-blind randomized controlled study to explore the impact of preventive home visits on the functional status (activities of daily living - health, mental health, activities, and participation) of 360 ambulatory frail elderly individuals who were living at home. Participants receiving preventive home visits were significantly more likely to maintain their activities of daily living (ADL) and less likely to increase care need level, in comparison to the control group. Results suggest that the updated preventive home visit program could be effective for the prevention of ADL and care-needs deterioration, and these effects could continue up to one year after programme completion. The importance of frailty prevention for ageing populations was also highlighted by Woo and colleagues (2015).

A systematic research of prospective and longitudinal studies was performed by Vermeulen and colleagues (2011) to study predictive value of physical frailty indicators on ADL disability in community-dwelling elderly people. Results showed that physical frailty indicators can predict ADL disability in community-dwelling elderly people. Slow gait speed and low physical activity/exercise seem to be the most powerful predictors followed by weight loss, lower extremity function, balance, muscle strength, and other indicators. The study suggests that monitoring physical frailty indicators in community-dwelling elderly people might be useful to identify elderly people who could benefit from disability prevention programs.

Fougère and colleagues (2017) conducted studies by using an observational research care model which uses a specialist nurse trained in primary care and geriatric assessment. Patients identified as potentially frail by the general practitioner or with a cognitive complaint or both, were assessed by the geriatric evaluation nurse within a general practitioner's office. Bleijenberg and colleagues (2012) described the U-CARE program, which was developed based on predefined guiding components comprising the three following steps: a frailty assessment to identify frail patients, a comprehensive geriatric assessment (CGA) of frail patients at home, followed by a tailor-made care plan with evidence-based interventions, and multiple follow-up visits.

Changes in health care systems and health care research for management of frailty

Ilinca and Calciolari (2015) analyzed a sample of 83,019 observations gathered in a multinational study involving 10 EU countries in order to examine the influence of frailty on the utilization of health care. The study has shown that functional decline, together with chronic conditions and disability, explain health care utilization in different care settings, after controlling for socio-economic and health status, and behavioural risks. GPs could lead screening initiatives to detect early frailty in the elderly, thus enabling the health system to target these individuals more effectively and avoid inappropriate frequent access to more expensive care settings and adverse outcomes. In a German research (Buttery, et al., 2015) modifiable characteristics such as low physical activity provided relevant targets for individual and population-level frailty detection and intervention strategies. Carretero and colleagues (2015) proposed the implementation of new strategies to improve prevention and early diagnosis of frailty and diseases related to age. A series of measures have been taken favouring the prevention of frailty and health promotion for elderly people. Early diagnosis of frailty and functional decline are considered to be effective measures against age-related comorbidities. Gu and colleagues (2016) investigated whether the socioeconomic status (SES) moderates the association between frailty and mortality. Frailty was a stronger predictor of mortality among individuals with higher SES than those with lower SES. The increased mortality risks associated with socioeconomic vulnerability and frailty weakened with age.

Discussion

Despite the large body of research defining the dimensions of frailty, no consensus exists on a comprehensive, operational definition. A standardized definition will be critical to design effective interventions at earlier stages along the continuum of frailty and interpret findings from evaluation studies (Mohandas, et al., 2011). However, the latest definition from the World Health Organization defines frailty as a progressive age-related decline in physiological systems that results in decreased reserves of intrinsic

capacity, which confers extreme vulnerability to stressors and increases the risk of a range of adverse health outcomes (WHO, 2017).

There are several frailty measures (Frailty Phenotype/ FP, Groningen Frailty Indicator/GFI and Tilburg Frailty Indicator/TFI) and each frailty measure classified a different group of individuals as frail (Metzelthin, et al., 2010; Theou, et al., 2013; Malmstrom, et al., 2014). To tackle frailty it is important to know the risk factors for frailty, as suggested in the research conducted by Veninšek and Gabrovec (2018). The potential causes are wider and include multiple risk factors which are implicated in various diseases and conditions (British Geriatrics Society, 2014). There is an effect of gender. The higher frailty index in women is mentioned in several publications (Woo, et al., 2005; Mohandas, et al., 2011; Buttery, et al., 2015; Coelho, et al., 2015a). The strongest risk factor is age and frailty prevalence clearly rises with age (British Geriatrics Society, 2014; Young, et al., 2016). Findings of a United Kindom based study among twins (Young, et al., 2016) indicate that frailty is both genetically and environmentally determined. Furthermore, there are several social determinants of frailty, covering socioeconomic factors, lifestyle, and social support (Woo, et al., 2005). Buttery and colleagues (2015) found an association between the socioeconomic status and frailty indicating a social gradient in frailty. Some studies (Guessous, et al., 2014; Coelho, et al., 2015a) found that the level of education is not associated with frailty, while lower household income is.

In terms of modifiable influences, the most studied is physical activity, particularly resistance exercise, which is beneficial both in terms of prevention and treatment of the physical performance component of frailty, which was also established in several clinical trials (Cadore, et al., 2013; Pahor, et al., 2014), where the results showed that frailty and frailty-related syndromes respond positively to structured exercise programs of strength training, consisting of low to medium exercise load. Moreover, the implementation of a simultaneous physical exercise program (combined aerobic and resistance exercise) to the diet is the best strategy for improving function in obese frail patients (Villarreal, et al., 2017).

The evidence for diet is less extensive but a suboptimal protein/total calorie intake and vitamin D insufficiency have both been implicated. There is emerging evidence that frailty increases with obesity, particularly in the context of other unhealthy behaviours such as inactivity, poor diet and smoking (British Geriatrics Society, 2014). Targeted interventions could have a significant impact on preventing the progression of frailty and the negative consequences of frailty. For an effective design and evaluation of interventions tailored to address frailty, priority must be given to achieving a consistent definition of frailty (Mohandas, et al., 2011). The aim of this research was to define

the role of prevention on the management of frailty at an individual level. For the purposes of this research, a narrative literature review method was used. The method proved to be appropriate and the aim was achieved.

The main limitation of the current literature review is inclusion of publications published in the last 15 years in the English language, therefore some relevant work may have been omitted. The methodological quality of included studies also varied, so conclusions should be drawn with caution.

Conclusion

Knowledge of the complexity of determinants of frailty can assist the formulation of measures for prevention and early intervention, however, for an effective design and evaluation of interventions tailored to address frailty, priority must be given to achieving a consistent definition of frailty. Early diagnosis of frailty and functional decline are considered effective measures against age-related comorbidities. Targeted interventions have a significant impact on preventing the progression of frailty and the negative consequences of frailty. Lifestyle, including physical activity (particularly resistance exercise) and nutrition (higher protein intake and vitamin D supplement), is a good measure for preventing disorders associated with age.

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Conflict of Interest / Nasprotje interesov

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