Introduction

Frailty is a syndrome involving increased vulnerability that results from age-related decline in physiological reserves and function in multiple organ systems, resulting in an impaired ability to respond to acute changes in health conditions (Rockwood 2005). The presence of frailty leads to an increased risk of adverse outcomes, including long-term care home placement and death (Clegg et al 2013, Mondor et al 2017).

Frailty has been identified as a continuum with three stages: robust or non-frail, pre-frail and frail (Fried et al 2001, Collard et al 2012). In the pre-frailty stage people experience a decline in physiological reserves but can respond adequately to stressors such as urinary tract infection; however, they remain at high risk of advancement on the frailty trajectory (Fried et al 2001, Ahmed et al 2007).

In the frailty stage there is further loss of physiological reserves resulting in an inadequate response to injuries or stressors, leading to incomplete recovery and residual deficits (Ahmed et al 2007). As the level of frailty increases, so does the risk of irreversible complications, potentially resulting in disability, frequent hospitalisation, nursing care home placement and death (Rodríguez-Laso et al 2018).

In a systematic review, Collard et al (2012) identified that the incidence of frailty increases with advancing age. Given that the ageing population is rising, there will continue to be an increase in those who are frail or are at risk of frailty (Fried et al 2001). Moreover, older adults who are classed as the most frail live in community settings such as their own homes, assisted living premises or retirement homes, rather than in nursing

Citation


Peer review
This article has been subject to external double-blind peer review and checked for plagiarism using automated software

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Conflict of interest
None declared

Accepted
17 February 2021

Published online
July 2021

Why you should read this article:

● To understand the effects of frailty on older people living in the community
● To improve your knowledge of assessment tools that can identify frailty
● To familiarise yourself with multicomponent interventions that can impede the development of frailty

Abstract

Frailty is a syndrome involving increased vulnerability that usually develops from age-related decline in physiological reserves and function in multiple organ systems, resulting in an impaired ability to respond to acute changes in health conditions. It is imperative that healthcare providers who work with older adults in primary care and community settings understand how to assess frailty and can identify appropriate interventions. This article reports the results of a rapid review that examined how frailty is assessed in community-dwelling older adults and what interventions are used to address frailty in this population.

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Keywords

community, community care, frailty, older people, patient assessment, patients, primary care, professional
homes (Dudgeon 2010). Therefore, healthcare providers such as nurses, physicians and allied health professionals who work with these older adults must understand how to assess frailty and identify the appropriate interventions that will optimise quality of life.

Although frailty is frequently seen in older people, it is important for nurses to note that it is significantly associated with biological pathways such as inflammation and decline in multiple organ systems, which are distinct from the normal physiological decline seen in advancing age (Clegg et al 2013, Dent et al 2016). In addition to these biological pathways, other factors can also be linked to frailty; for example, social determinants of health such as poverty, polypharmacy, depression, medical conditions and sedentary lifestyles (Clegg et al 2013, Dent et al 2016).

**Aim**

There is no standardised tool to assess frailty in older adults in primary care and community settings (Lee et al 2015), nor is there a ‘gold standard’ approach to providing interventions to reverse or prevent the progression of frailty. The authors, therefore, undertook a rapid review that aimed to answer two questions:

» How is frailty assessed in community-dwelling older adults?

» What are the interventions used to address frailty in community-dwelling older adults? A rapid review is a type of knowledge synthesis that simplifies the literature review process to produce information in a timely manner. This article reports on and discusses the findings of the rapid review.

**Method**

MEDLINE and CINAHL databases were searched for studies published between January 2015 and April 2020. Based on the aims of the review, three main concepts comprised the search strategy: ‘older adults’, ‘community-dwelling’ and ‘frailty’. Primary studies in English were included based on the following criteria:

» Focus on community-dwelling older adults aged 65 years and over served by healthcare providers in primary care and community settings.

» Examination of tools for frailty assessment in primary care and community settings and/or those that examined frailty interventions for community-dwelling older adults.

EndNote reference manager was used to collate 463 retrieved studies and following systematic de-duplication, a final unique set of 415 studies were imported into the Covidence web-based software programme to streamline the screening process and study selection (www.covidence.org).

During the first stage of study selection, the titles and abstracts of each article were screened by two independent reviewers. In the second stage of study selection, full-text screening was completed for 201 articles deemed relevant based on a priori inclusion criteria. An additional article was identified in the reference list of one of the included studies. Figure 1 shows a PRISMA flow diagram that details the full data collection process (Page et al 2021). Data were extracted using a pre-piloted form based on details of the study, participant characteristics, frailty definitions, assessment tools and frailty interventions.

**Findings**

**Characteristics of studies and participants**

The search yielded 30 studies; 14 of these evaluated frailty assessment tools and 16 examined interventions that were used to address frailty. The studies were conducted in 15 countries in North America, South America, Europe, Asia and Australia. The mean age of participants ranged from 69.5 years (Dong et al 2018) to 97.7 years (Kwan et al 2015). The percentage of women in the studies ranged from 25% (Seino et al 2017) to 81% (Takano et al 2017).

**Figure 1.** PRISMA flow diagram showing full data collection process

### Key points

- Healthcare providers in primary care and community settings must be able to identify frailty and optimise care accordingly for older adults living with frailty.

- There is no standardised tool to assess frailty and those that have been developed use a range of diverse methods.

- Most interventions focus on the early stages of frailty and promote physical activity.

- However, multicomponent and interdisciplinary interventions are more effective in reversing and/or reducing frailty in community-dwelling older adults.
In most cases, participants were classified as either robust, pre-frail or frail. The percentage of non-frail participants ranged from 9.8% (Nascimento et al 2018) to 75.3% (Toosizadeh et al 2015). The percentage of pre-frail participants ranged from 29.7% (Park et al 2019) to 56.9% (Tang et al 2015). The percentage of frail participants ranged from 4% (Dong et al 2018) to 33.4% (Nascimento et al 2018). In one study, nine participants (7.8%) were classified as very frail (Oubaya et al 2017).

Only one study assessed interventions targeted specifically for frail older adults with dementia (Karssemeijer et al 2019), and only four intervention studies included a percentage of participants with cognitive impairment or dementia (Luger et al 2016, Theou et al 2017, Huguet et al 2018, Bazán et al 2019). The remainder of the intervention studies excluded people with impaired cognition.

Frailty assessment in community-dwelling older adults

There is a significant need to identify valid and easy-to-use tools that can assess frailty in community-dwelling older adults, as well as to monitor the outcomes of any interventions used to address such frailty. The search identified 16 tools, which were evaluated in 14 studies. Four tools were clinician-administered (Tang et al 2015, Oubaya et al 2017, Nascimento et al 2018, do Carmo Correia de Lima et al 2019), and five involved self-report on behalf of the participants (Kwan et al 2015, Bongue et al 2017, Dong et al 2018, Park et al 2019). Three tools involved clinician assessment and participant self-report (Bongue et al 2017, Bouzón et al 2017, Thompson et al 2018), while four involved the use of technology (Toosizadeh et al 2015, Clegg et al 2016, Parvaneh et al 2017, Ruiz et al 2018).

Table 1 details the frailty assessment tools used with community-dwelling older adults. Table 1 also shows the relevant psychometric properties and clinical implications, as well as the administration method used, for example clinician-administered tools, participant self-reported tools, tools that use technology and clinician assessment, and participant self-administered tools.

Interventions aimed at addressing frailty in community-dwelling older people

Most of the studies used Fried et al’s (2001) criteria to describe frailty. The studies also varied considerably in the type, method and combination of interventions that they used, and the duration of interventions ranged from three to 31 months. A variety of intervention components were found, with most of the studies (n=12) using a combination of components. The intervention components included physical activity (n=13); nutrition (n=7); psychosocial intervention (n=4); medical management (n=2); and cognitive training (n=1). The comprehensive geriatric assessment (CGA) (Ellis et al 2017) was used in four studies. Details about interventions are shown below and are categorised as physical activity-based interventions and CGA-based interventions.

Physical activity-based interventions

Of the 16 intervention studies, 12 examined physical activity interventions as a solo component (n=5) or as part of a multicomponent intervention (n=7). The type, duration, location and facilitator varied in all these studies.

Physical activity as the solo intervention

Physical activity was used as a single-component intervention in five studies (Tarazona-Santabalbina et al 2016, Makizako et al 2017, Takano et al 2017, Trombetti et al 2018, Karssemeijer et al 2019), two of which resulted in a statistically significant decrease in frailty scores (Tarazona-Santabalbina et al 2016, Karssemeijer et al 2019). For example, Karssemeijer et al (2019) found that participants who received in-class cognitive-aerobic bicycle training had a reduced frailty score compared with the control group who received relaxation and flexibility exercises (P=0.012). The remaining three studies reported significant improvement in function such as walking speed but no effect on reversing or preventing frailty (Makizako et al 2017, Takano et al 2017, Trombetti et al 2018). All studies varied in types of exercise, intensity, duration, frequency and location, such as in-class or at home.

Multicomponent physical activity interventions

preventing frailty in the intervention group \((P=0.044)\). The authors in two other studies examined interventions that combined physical activity, nutrition and social support in pre-frail and frail participants (Luger et al 2016, Seino et al 2017), one of which resulted in a significant reduction in frailty prevalence and frailty score \((P<0.017)\) (Seino et al 2017), while the other did not \((P=0.623)\) (Luger et al 2016).

**Comprehensive geriatric assessment-based interventions**
Four studies examined the effect of CGA-based interventions involving an interdisciplinary team either at participants’ homes or in clinic (Ekdahl et al 2016, Theou et al 2017, Bazán et al 2019, Mazya et al 2019). In one study, the team collaborated on developing and revising comprehensive care plans specific to participants’ needs with intervention components such as reducing polypharmacy, advising on exercise or diet, providing adaptive equipment and social support (Mazya et al 2019). After 24 months there was a significantly reduced proportion of frail \((P=0.002)\) and substantially higher proportion of pre-frail participants \((P=0.004)\) in the intervention group.

Theou et al (2017) combined the CGA with health coaching to achieve goals related to exercise, chronic disease management and connections to community resources and reported a significant reduction in frailty scores at follow-up \((P<0.05)\). In another study, the intervention group participants had significant effects in reducing the burden of frailty, for example they lived for 69 days longer \((P=0.026)\) and had a lower number of inpatient days \((P=0.01)\) than the control group (Ekdahl et al 2016).

**Discussion**
This rapid review examined the literature to identify tools to assess frailty and interventions to address frailty that can be used by healthcare providers caring for older adults in community and primary care settings. Frailty is regarded as a trajectory in which people’s degree of impairment can vary (Fried et al 2001, Collard et al 2012).

Variations in how frailty has been measured and the participants’ heterogeneity must be considered when applying the results of this review to clinical practice. Therefore, when choosing a tool, healthcare providers should consider the unique characteristics of older adults such as level of health literacy, sensory status and ethnicity and background. They should also consider the amount of time, space and resources required to use the tool.

Most of the interventions examined by this review were aimed at people who could meet high levels of physical and cognitive requirements, which raises concerns about applicability to those with advanced stages of frailty and/or cognitive impairment, since these were not studied. Although often associated with frailty (Chong et al 2014), cognitive impairment was rarely a participant characteristic. The rapid review revealed that interventions to reduce frailty yield more significant results when they are part of a multicomponent and interdisciplinary approach.

Nurses and other healthcare providers are well-positioned to identify frailty in older adults under their care, as well as considering them from a physical, cognitive, emotional and social perspective to recognise which health and social services interventions may be appropriate. For example, many of the significant findings of this review involved interventions that may not be feasible for older adults depending on their level of social support, such as needing to be driven to in-class programmes, financing the cost of dietary interventions or having physical/cognitive limitations such as a lack of motivation caused by pain and depression.

Nurses can act as effective advocates for people with frailty and assist with the coordination of care, for example promoting intersectoral and interdisciplinary collaboration involving informal care partners, such as family and friends. Future studies should focus on examining the effect of interventions on people at advanced stages of frailty, including those at the end of life.

**Limitations**
The authors reviewed only the most recent evidence published in English that involved community-dwelling older adults.

**Conclusion**
As the average age of the general population increases, the incidence of frailty will also increase, leading to a subsequent rise in adverse health outcomes such as disability, the need for nursing home placement and death. It is crucial that healthcare providers in primary care and community settings can identify frailty and optimise care for frail older adults. Multicomponent, interdisciplinary interventions can prevent and reverse the early stages of frailty.
### Table I. Frailty assessment tools used with community-dwelling older adults

<table>
<thead>
<tr>
<th>Tools</th>
<th>Author (date)</th>
<th>Country</th>
<th>Tool name</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td><strong>Clinician-administered tools</strong></td>
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<tr>
<td>do Carmo Correia de Lima et al (2018)</td>
<td>Brazil</td>
<td>Combination of usual walking speed (UWS) and maximum walking speed (MWS)</td>
<td>4.6 metre walk at UWS and MWS</td>
<td>Frailty demonstrated by insufficient WRC (UWS &lt;1 metre per second; and MWS &lt;1 metre per second)</td>
</tr>
<tr>
<td>Oubaya et al (2017)</td>
<td>France</td>
<td>Short Emergency Geriatric Assessment (SEGAm)</td>
<td>13 items, overall score of 26 points</td>
<td>Frail: score between 8 and 12 Very frail: score ≥12</td>
</tr>
<tr>
<td>Tang et al (2015)</td>
<td>Taiwan</td>
<td>Dual-Task Timed Up and Go tests (TuGmanual and TuGCognitive)</td>
<td>Dual-task TUG test: TuGmanual: 3-minute walk while carrying a cup of water. TuGCognitive: 3-minute walk while counting backwards</td>
<td>Pre-frail: TuGmanual is ≤8.2 seconds</td>
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<tr>
<td>Nascimento et al (2018)</td>
<td>Brazil</td>
<td>Blood sampling</td>
<td>Includes sampling for basic metabolic parameters and inflammatory cytokines such as: Interleukin-1 alpha Interleukin-1 beta</td>
<td>Interleukin-6 Tumour necrosis factor (TNF)-alpha and TNF-beta Inflammatory cytokines</td>
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<tr>
<td><strong>Participant self-administered tools</strong></td>
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<tr>
<td>Bongue et al (2017)</td>
<td>Canada</td>
<td>The Groningen Frailty Indicator (GFI) and the Vulnerable Elders Survey-13 (VES-13)</td>
<td>The GFI: 15 items; focuses on the loss of function and physical, cognitive, social and psychological domains Frailty: score ≥4</td>
<td>The VES-13: 13 questions; self-rated health, physical fitness and the need for assistance with activities Frail: score ≥3</td>
</tr>
<tr>
<td>Dong et al (2018)</td>
<td>Eastern China</td>
<td>The Chinese FRAIL scale</td>
<td>Cultural adaptation of 5-item tool including fatigue, resistance, ambulation, illness and weight loss components</td>
<td>Scores: Frail: ≥2 Pre-frail: 1 Robust: 0</td>
</tr>
<tr>
<td>Kwan et al (2015)</td>
<td>Hong Kong</td>
<td>A Comprehensive Model of Frailty (CMF)</td>
<td>To the existing 32-item Frailty Index (FI-32), 12 new items were added in the following domains: Psychological well-being</td>
<td>Social and/or family factors Environmental factors Economic factors</td>
</tr>
<tr>
<td>Park et al (2019)</td>
<td>Korea</td>
<td>Social Frailty Index</td>
<td>5-item social frailty index regarding: Going out Visiting friends Being alone</td>
<td>Not talking with someone every day Social frailty defined as ≥2 positive responses</td>
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<tr>
<td><strong>Tools that use technology</strong></td>
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<tr>
<td>Clegg et al (2016)</td>
<td>UK</td>
<td>Electronic Frailty Index (eFI)</td>
<td>Uses routinely collected data from electronic health records Assesses presence of 36 deficits, for example: Activity limitation Falls Weight Anorexia</td>
<td>Care requirements eFI scores: Fit: 0-0.12 Mild frailty: 0.12-0.24 Moderate frailty: &gt;0.2-0.36 Severe frailty: &gt;0.36</td>
</tr>
<tr>
<td>Parvaneh et al (2017)</td>
<td>US</td>
<td>Shirt-embedded sensor</td>
<td>Wearable technology Detects and counts postural transitions including sit-to-stand and sit-to-walk</td>
<td>Frailty: a decrease in the number of postural transitions was an independent variable that identified frailty</td>
</tr>
<tr>
<td>Ruiz et al (2018)</td>
<td>US</td>
<td>The Care Assessment Need (CAN) score</td>
<td>The CAN score is automatically generated from electronic health record data such as medical conditions and laboratory tests</td>
<td>Frailty: CAN score of 55</td>
</tr>
<tr>
<td>Toosizadeh et al (2015)</td>
<td>US</td>
<td>One triaxial wearable gyroscope sensor</td>
<td>Wireless sensors attached to the upper arm and forearm</td>
<td>Participants undertake repetitive elbow flexion for 20 seconds on each side to discern frailty</td>
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<tr>
<td><strong>Clinician and assessment participant self-administered tools</strong></td>
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<tr>
<td>Bouzdn et al (2017)</td>
<td>Spain</td>
<td>Standardised frailty phenotype criteria (S-FPC)</td>
<td>Participants assessed on: Slowness Weakness Weight loss</td>
<td>Suboptimal endurance Physical activity All levels of frailty assessed</td>
</tr>
<tr>
<td>Bongue et al (2017)</td>
<td>Canada</td>
<td>Abbreviated Comprehensive Geriatric Assessment (aCGA)</td>
<td>aCGA has 15 questions covering functional status, cognitive status and depression</td>
<td>Frailty: further assessment of frailty was required if a positive score was identified in one of the aCGA domains</td>
</tr>
<tr>
<td>Thompson et al (2018)</td>
<td>Australia</td>
<td>Frailty index</td>
<td>34 items including self-reported health and clinical measurements such as blood pressure and grip strength</td>
<td>Non-frail and pre-frail: 0 to ≤0.21 Frail and most frail: &gt;0.21</td>
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<tr>
<td>Psychometric properties</td>
<td>Clinical implications</td>
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| **UWS at 1 metre per second:**  
  - Sensitivity: 0.8  
  - Specificity: 0.6 | Requires a stopwatch  
  A low-cost clinical tool that can identify and monitor frail older people living in the community  
  Requires little space and time making it a suitable routine measure |
| **Cronbach's alpha: 0.68** | Easy to implement by health and social care staff  
  Short administration time  
  Adapted for French-speaking people |
| **TUGmanual:**  
  - Sensitivity: 83%  
  - Specificity: 64% | If the TUGmanual score is ≤8.2 seconds people are likely to have pre-frailty  
  The TUGcognitive (≤14.3 seconds) could not sensitively detect pre-frailty in the study |
| **GFI ≥4:**  
  - Sensitivity: 55.9%  
  - Specificity: 76.5% | VES-13 showed considerable sensitivity for predicting the occurrence of:  
  - Disability (91.0%)  
  - Mortality (89.7%)  
  - Institutionalisation (92.3%)  
  VES-13 is a sensitive tool for identifying frailty and predicting the occurrence of disability, mortality and institutionalisation |
| **Measured against Fried et al’s (2001) frailty phenotype and demonstrated fair agreement (kappa=0.274):**  
  - Sensitivity: 86.96%  
  - Specificity: 85.64% | Quick assessment  
  Can be used to screen frailty in Chinese community-dwelling older adults |
| **FI-32:**  
  - Cronbach’s alpha 0.67 | The CMF provided significantly more predictive power for self-rated health in centenarians than the Frailty Index alone |
| **Social frailty score correlated with most geriatric syndromes including:**  
  - Multimorbidity  
  - Cognitive impairment  
  - Depressive mood  
  - Sarcopenia  
  - Dysmobility  
  - Falls  
  - Polypharmacy  
  - Malnutrition (rho range: 0.172 to 0.688, \( P = 0.001 \) to <0.001) | Quick assessment  
  Screening for social frailty in rural settings can identify community-dwelling older people's health and social needs |
| **Optimal discrimination for outcomes of mortality and nursing home admission**  
  **Moderate discrimination for outcome of hospitalisation** | Automated approach can support development of proactive, goal-oriented care for frail older adults |
| **Sensitivity: 87.99%  
  Specificity: 87.99%** | Sensor is worn for 24 hours  
  Represents a practical tool that can be used in people’s homes without supervision |
| **Sensitivity: 91.67%  
  Specificity: 40.32%** | Automated approach can serve as an initial frailty-screening tool for patients in primary care settings |
| **Sensitivity and specificity of 100% in predicting frailty**  
  **Sensitivity of 87% and specificity of 95% in predicting pre-frailty (compared with Fried et al’s (2001) frailty category)** | Takes less than 1 minute  
  Scoring requires healthcare professionals to undertake a complex mathematical calculation |
| **5-FPC consistently identified pre-frail people as an intermediate risk group between robust and frail people** | Requires hydraulic dynamometer for grip-strength measurement  
  Needs to be standardised according to the characteristics of the population to improve its predictive ability |
| **To demonstrate institutionalisation, an aCGA score of ≥1 was required:**  
  - Sensitivity: 84.6%  
  - Specificity: 51.3% | The aCGA had a higher sensitivity than Fried et al’s (2001) scale for identifying older people who were institutionalised |
| **The frailty index and frailty phenotype demonstrated a significant correlation in continuous scores, but only a modest kappa score of 0.38 in their ability to classify individuals as either frail or non-frail** | The frailty index identified a larger number of participants as frail  
  Consists of self-reported and clinical measurements  
  May be more appropriate to use in clinical settings due to its sensitivity in identifying at-risk individuals |
References


