

Frailty, Exercise and Nutrition



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KEYWORDS

• Frailty • Sarcopenia • Physical exercise • Nutrition • Multicomponent intervention

KEY POINTS

- Age, genetics, epigenetics (nutrition, physical exercise), and environment play key roles in the frailty process.
- Frailty may be delayed or even reversed by physical exercise, with or without nutrition supplementation, or by targeted interventions on specific frailty components.
- A review of physical activities and nutrition interventions testified that sarcopenia, a major component of physical frailty, could be delayed or reversed.
- Multidomain interventions are promising. First results are encouraging, but the sole economic evaluation performed to date demonstrated the very high costs of such interventions.

Frailty is characterized by increased vulnerability to stressors that puts older subjects at risk of developing adverse outcomes, including hospitalization, disability, and mortality.^{1,2} With population aging, frailty is becoming a silent epidemic, affecting older adults.³ In the largest survey to date performed in Europe, namely the Survey of Health, Aging and Retirement in Europe (SHARE), a multidisciplinary, cross-national panel database of microdata on health, socioeconomic state, and social and family networks including more than 85,000 individuals aged 65 or over (approximately 150,000 interviews) from 19 countries across Europe and Israel,⁴ the prevalence of frailty (using an adapted version of Fried's criteria of physical frailty⁵) reached 17%, varying from 5.8% in Switzerland to 27.3% in Spain. The prevalence of prefrailty was considerably higher, ranging from 34.6% in Germany to 50.9% in Spain.⁶ In SHARE, mortality exponentially increased from robust to prefrail to frail subjects (Fig. 1).⁷

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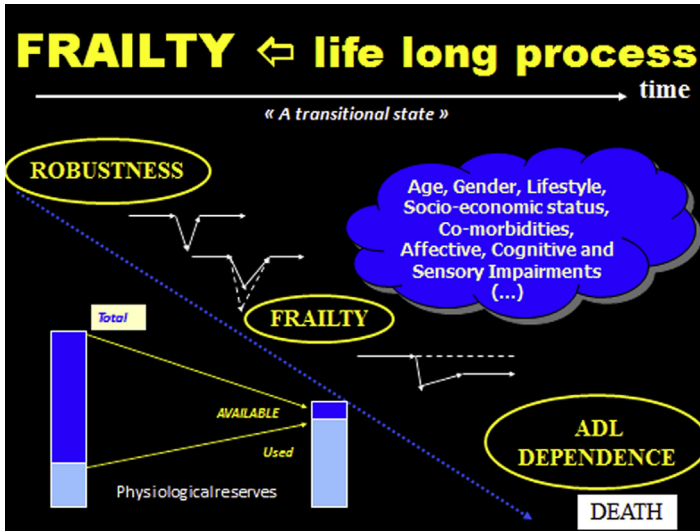


Fig. 1. Frailty is included in a transitional state between robustness, dependency, and death. ADL, activities of daily living.

Such data explain the urgent need to establish a universal definition of the frailty syndrome,³ to detect prefrail individuals at an early stage in the community, and to implement effective prevention strategies.^{8–10} Early intervention in frail individuals has the potential to retard or prevent disability, one of the key objectives of gerontology today.

The main components of the frailty phenotype as described by Fried and colleagues⁵ are physical. Age, undernutrition, and sarcopenia play major roles in the vicious cycle of frailty,^{11–13} explaining why various authors have proposed sarcopenia to be considered as the equivalent of physical frailty.^{14–16} After the publication of the European consensus definition of sarcopenia,¹⁷ a systematic review by an international working group of all published randomized trials (RCTs) showed that sarcopenia could be reversed, either by physical exercise, protein/amino acid diet interventions, or a combination thereof.¹⁵ However, there again, the main problem with sarcopenia is its early detection, based on acknowledged criteria that need to be adapted to differences in the studied populations.^{18–21}

In this rapidly evolving context, a major issue is linked to the fact that no consensus yet exists on how to identify prefrail and frail adults within the community, as recently stressed by the new British Geriatric Society guidelines.²² The main purpose of the present article is to demonstrate that physical frailty, closely resembling sarcopenia, may be reversed by physical exercise, nutritional interventions, or a combination of the two. It should also be borne in mind that, beyond the physical features, the frailty syndrome also includes at least two other components, namely cognition and socioeconomic status.^{23–25} Physical and cognitive frailty share some common pathogenetic pathways,²⁶ and consequently, certain interventions might impact both conditions.

This article first reports the spontaneous course of frailty conditions, and then focuses on randomized, controlled frailty interventions (such as physical exercise, nutrition, combined exercise plus nutrition, and multifactorial interventions) or metaanalysis in community-dwelling older adults or volunteers published in 2012, 2013, and 2014. The main take-home messages that emerge from recent literature are summarized.

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