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Frailty and Multimorbidity: Different Ways of Thinking About Geriatrics

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A B S T R A C T

The terms *multimorbidity* and *frailty* are increasingly used in the medical literature to measure the risk profile of an older individual in order to support clinical decisions and design ad hoc interventions. The construct of multimorbidity was initially developed and used in nongeriatric settings. It generates a monodimensional nosological risk profile, grounding its roots in the somewhat inadequate framework of disease. On the other hand, *frailty* is a geriatric concept that implies a more exhaustive and comprehensive assessment of the individual and his/her environment, facilitating the implementation of multidimensional and tailored interventions. This article aims to promote among geriatricians the use of terms that may better enhance their background and provide more value to their unrivaled expertise in caring for biologically aged persons.

The terms *multimorbidity* and *frailty* are increasingly used in the medical literature and among health care professionals. Although capturing different aspects of the individual's health status, they are sometimes used interchangeably. In particular, the words *multimorbidity* and *frailty* are used to measure the risk profile of an older individual in order to support clinical decisions and design ad hoc interventions. This article aims to describe the similarities and differences underlying the two constructs with the aim of promoting terminology standardization in the field of geriatrics.

The Concept of Multimorbidity

Multimorbidity is usually defined as the coexistence of two or more chronic diseases in the same individual.[1] It may be viewed as an evolution of the *comorbidity concept*, which refers to "the existence or occurrence of any distinct additional entity during the clinical course of a patient who has the index disease under study."[2] It is readily evident that, as opposed to comorbidity, multimorbidity is a patient-centered entity, in which no index disease is pre-defined. The difference is not trivial because it suggests the adoption of inherently different clinical approaches. To make it simple, whereas comorbidity paves the way for a disease-centered model of care in which a specific clinical condition is prioritized over the others, multimorbidity implies a more holistic evaluation of the individual's clinical complexity, in which all co-occurring conditions are attributed the same dignity.

Shifting the attention from single diseases to the resultant of multiple conditions marks an important step forward in the evolution of care, making it more respondent to the medical needs of an aging and multimorbid society. At the same time, because multimorbidity increases with age, it may be used as a marker of biological aging to support the required adaptations to models of care.[3] It was conceptualized to capture in an integrated way the continuous exposure to age-related chronic conditions.

Yet, some major limitations remain. First, there is no standard definition of *multimorbidity* or consensus about the conditions to be considered in its computation. Moreover, clinical conditions are equally weighted in multimorbidity, suggesting that the relationship between the number of diseases and the risk of negative health-related outcomes might follow a linear trend. As also explained in the recent *World Report on Ageing and Health* by the World Health Organization,[4] this is not the case. In fact, the impact of multimorbidity on the individual's risk profile can be substantially greater than the mere sum of the singular effects that are expected from the computed conditions. The

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nonlinear pattern followed by multimorbidity with age has also been described from a biological perspective by Fabbri and colleagues[5] in the InCHIANTI study. Their analyses showed that the accumulation of diseases accelerates later in life, and this phenomenon is enhanced by the patient's underlying inflammatory status. In other words, 1 plus 1 rarely equals 2 in the clinical setting; it rather results in something ranging between 2 and a lot!

The Concept of Frailty

An international panel of experts defined frailty as "a medical syndrome with multiple causes and contributors that is characterized by diminished strength, endurance, and reduced physiologic function that increases an individual's vulnerability for developing increased dependency and/or death."[6] Frailty is a multidimensional condition. The impairment of different biological functions (eg, physical function, cognitive function, psychological function) defines different manifestations of frailty, all of which are valid and legitimate.

Although the theoretical definition of *frailty* is largely agreed upon, there is great controversy and multiple ambiguities concerning the practical translation of the concept in a unique operational instrument. The dispute regarding instruments has led to a loss of focus on the condition of interest, by paying more attention to the tools for its assessment (which is aberrant). As a result, it often seems as though the choice of instrument for measuring frailty is more important that the frailty condition itself.[7]

Leaving aside the instruments for assessing frailty and just examining the theoretical framework of this geriatric condition, it is easily realized that frailty was conceptualized for capturing the "chronological age-independent" biological status of the older person. The term *frailty* was conceived to measure the balance between the entropic forces acting against the organism and its homeostatic reserves.[8] In other words, without specifically looking at diseases (either alone or combined in the context of multimorbidity), the term *frailty* captures the biological decline of the aging individual and his/her risk profile for negative health-related outcomes.[9]

The Relationship Between Frailty and Multimorbidity

In a seminal article published in 2004, Fried and colleagues presented a Venn diagram showing the relationship between frailty (measured according to the phenotype model), disability (defined as limitation in one or more activities of daily living), and multimorbidity (computed as two chronic conditions or more).[10] Figure 1A shows an overlapping and possible partial coexistence of the three concepts, which were considered independent at the same level and potentially mutually interacting. Interestingly, this model does not automatically exclude the possibility that a person may simultaneously be frail, multimorbid, and disabled.

Over the years, frailty has been repeatedly indicated as a target condition of special interest for interventions against the age-related disability process.

Accordingly, frailty has often been framed as a "pre-disability condition,"[11–13] in which disability served as the primary outcome of interest (Figure 1B). This is also a legitimate and valid choice, in which the objective of the intervention (ie, prevention of disability) leads to a potential selection of the overall population exposed to enhanced vulnerability. In other words, a methodological choice is applied over a biological concept in order to correctly implement a clinical/research action.

If frailty is more broadly considered as a condition of public health interest,[14] however, the scenario changes substantially. In fact, if frailty is conservatively considered as a condition of extreme vulnerability to stressors exposing the organism at increased risk of negative outcomes, the concepts of multimorbidity (but even disability) may become secondary (Figure 1C).

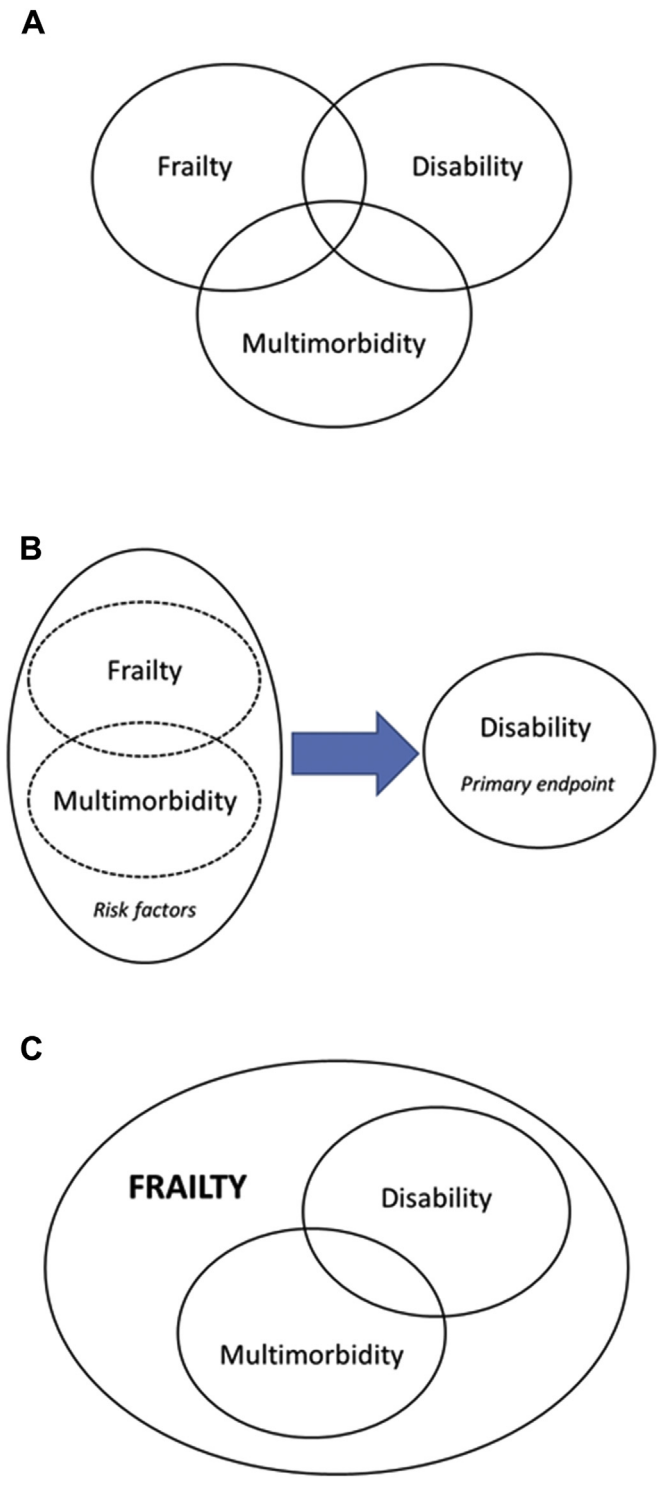

Fig. 1. Different theoretical ways of considering the relationships between frailty, multimorbidity, and disability in the elderly. (A) Phenotype model: Frailty, multimorbidity, and disability are three independent and mutually interacting conditions of similar weight. (B) Pre-disability model: Frailty and multimorbidity are two related risk conditions for incident disability. (C) Model for adapted care: Frailty is the umbrella for adapted (geriatric) interventions, which include multimorbidity and disability as possible targets.

Envisioning frailty as the crossroad between usual and adapted care implicitly transforms this condition in the actual foundations of geriatric medicine and the keystone for reshaping our obsolete health care systems (still based on the anachronistic criterion of "age" to