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Editorial

Resilience in Nursing Home Residents

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Defining resilience in older adults has stimulated the scientific debate for decades. There is no consensual theoretical or practical definition of resilience in older adults. However, in an overall definition, resilience can generally be considered within a broad bio-psycho-social model of health, with both (i) physical (referring to independence in activities of daily living (ADL)), physical, psychological and social health dimensions (1) and (ii) adaptive aspects to a stressful situation for physical and mental health, as well as the ability to mobilize social support in the community. In this model, resilience would be a response to various environmental challenges, including physiological, psychological and social challenges (2).

More specifically, physical resilience relates to functional capacity and its evolution after facing a challenge. Assessing resilience depends on the static assessment of physiological, psychological, and social reserves, and on the dynamic assessment of the capacity to recover. Comprehensive geriatric assessment tools easily provide the static assessment, but the dynamic assessment cannot be performed outside the context of a stressor. Investigating this missing part would be of great importance for clinical decision-making, especially in the frailest older adults like long-term care facility (LTCF) residents, and remains an open field of research. The third parameter that predicts the ability to recover is the level of stressor, which can be subjective (e.g. the psychological stressor of widowhood) or objective (e.g. a more or less challenging chemotherapy).

In clinical practice, functional capacity evolution through such stressors informs practitioners on resilience a posteriori only (3). A posteriori evaluation of resilience can inform further clinical decisions and stimulate advance care planning, like deciding to withhold procedures or transitions of care which previously showed inefficient to reach relevant goals of care, particularly when palliative care is required. On the contrary, better a priori assessments of resilience could improve care before the stressor results in disability (4). Low resilience in older adults is associated with longer stays in rehabilitation compared to non-resilient older adults (3). Lower physical resilience in older adults compared to young adults has been repeatedly reported. When immobilized, quadriceps force hardly recovers in older adults after two weeks of immobilization followed by four weeks of retraining, whereas it does in all younger adults (5). The identification of the population at risk of inability to recover could help clinical decision-making, like prescribing a longer rehabilitation time before immobilization, or modifying the scheme and intensity of rehabilitation to set more modest – yet achievable – functional objectives. These results concur with the definition of physical resilience previously proposed by Whitson and colleagues, in which physical resilience was defined as a characteristic which determines one's ability to resist or recover from functional decline following health stressor(s) (6). In a subsequent debate, Ukraintseva and colleagues proposed to further define resilience as the ability to quickly and completely recover after a deviation from the original state (7). Time to recover and magnitude of recovery may therefore be used to estimate physical resilience (8). To date, our inability to predict poor recovery capacity may result in excessively long periods of hospital-based rehabilitation and yet sometimes lead to institutionalization in a nursing home or a LTCF (9).

When considered a reserve, resilience refers to multiple domains of physiological, physical, psychological, and cognitive capacities to adapt to stress (10). Examples of physical capacities evaluations include quadriceps force, showing much higher results in younger than in older adults (5). Since the first studies on comprehensive geriatric assessment, measuring resilience reserves has been one of the added value of geriatricians' input in clinical decision-making, by predicting clinical outcomes and thus facilitating decisions between therapeutic options on a scope from minor to major stressors (11). Stressors may be very diverse (12) and include either the disease or even its treatment, like the trauma and/or its surgery, vaccination and/or COVID-19, emergency department transfer and/or the underlying condition, radiation therapy and/or the cancer itself, etc. Stressors may also include dramatic social changes like widowhood.

However, static assessments have a limited predictive value for complications, adverse events and mortality (13), and a poor predictive value for recovery potential and beneficial outcomes (14). The uncertainty of predicting outcomes after a stress (such as chemotherapy or surgery) using static reserve assessment only, provides little and approximate support to clinical decision-making. A dynamic assessment of physical resilience as the ability to recover function after a health stressor (10), with clinical or biological markers in addition to the usual static assessment, may complete resilience evaluation. An improvement of resilience measurements' accuracy would

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result in better decision-making for clinicians.

Admission to an LTCF should be associated with a personalized plan of care to preserve the remaining resilience of the residents, like staying at home requires the older adults to preserve their functional reserves (15). Maintaining residents' resilience allows them to recover better after a stressful event and thus improve their quality of life (15). The poorer quality of life of LTCF residents compared to older adults living at home is probably also linked to their lower resilience (16). Functional capacity evolution of LTCF residents through a transfer to the emergency department, for example, illustrated resilience in this population (17). High baseline functional capacity was associated with resistance to deviation (7) whereas lower baseline functional capacity was associated with deviation from the initial state. Subsequent trajectories of ADL performance showed higher magnitude of recovery in residents with a higher baseline functional capacity, and little or no recovery in poorest performing residents, suggesting the former were resilient and the latter were not. But functional capacity being very low in this mostly dependent population, other indicators should be considered for a more sensitive evaluation of resilience, like symptom evolution through a health stressor (18). These a posteriori indicators could inform advance care planning after discharge back to the nursing home, by suggesting expected outcomes after probable next acute episodes. Whether a priori indicators can be identified, to avoid potentially inappropriate and/or preventable burdensome transitions of care remains an open question.

Our ability to predict quick and complete recovery of function might be accessible using clinical or biological biomarkers in the future. Rapid advances in the field of Geroscience and a better understanding of biological mechanisms of aging could provide solutions to better characterize the resilience of older adults and identify those LTCF residents with a low resilience. Their identification could result in the use of preventive innovative treatments (such as drugs to prevent loss of muscle mass, or drugs to prevent delirium) before being transferred to the hospital, i.e. being exposed to a stressor.

LTCF residents may be an interesting target population for testing the capacity of new geroprotectors such as senolytics (19) to improve resilience in older adults. Like other innovative molecules targeting the hallmarks of aging, research on senolytics in LTCF residents could be relevant given the favorable risk-benefit balance, with a high prevalence of poly-pathology in this population, including severe conditions like dementia and organ failure, and the irrelevance of long-term safety issues in this population with a short life expectancy (19). These treatments could easily yield clinically significant positive outcomes in LTCF residents showing very low levels of resilience. However, the clinical heterogeneity of this population remains an important challenge for conducting drug trials in this population.

Before that, certain obstacles to research for institutional residents will have to be lifted, as will certain ethical considerations concerning informed consent and access to drug innovation in this population.

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