Reviewer’s report

Title: Fried phenotype of frailty: cross-sectional comparison of three frailty stages on various health domains.

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Reviewer: Melissa K. Andrew

Reviewer’s report:

This is an interesting and generally well written paper in which the authors investigate associations between the frailty phenotype and other aspects of health, including social, psychological, and physical domains. The analysis uses a population-based cross sectional study from Limburg, the Netherlands. The five frailty criteria are measured using self report. The authors find that there is a dose responsive association between frailty and all of the social, psychological and physical functioning domains and suggest that use of frailty criteria may help healthcare professionals identify and treat older patients as well as indicate where problems may exist in other domains. In general, I find this a useful piece of work that extends what is known in existing literature. I have the following comments:

1. The authors make mention of other approaches to measuring frailty which are more multidimensional in and of themselves. Do they feel that their findings may provide support for the idea that frailty is indeed inherently multidimensional and should be measured using more than the five of physical criteria? Or do they feel that the simplicity of the five item physical phenotype outweighs the downsides of leaving out other areas of health? This would be interesting to see discussed.

2. The authors have creatively addressed the challenge of operationalizing the frailty criteria using self-report items, though as they describe the frailty phenotype usually includes some objective measures. For example, the slow walking speed item was measured using a question about whether the respondent can get to the other side of the street at a zebra crossing during the green light. This is an interesting way to get at measuring walking speed, and it does have the benefit of being somewhat objective. Is there a standard walking speed that zebra crossing time is based on in this jurisdiction? This would be interesting to know, and may help other researchers who are developing frailty measures in their own settings. The grip strength question seems like it may be a little weaker, being very subjective and not necessarily reflecting true weakness, though later in the discussion the authors do show that it has a reasonable distribution and may be a fine way to measure grip strength in population studies. Overall, a bit more discussion about the authors’ perception of their frailty measure’s validity would be useful. For example, the dose response association with the disability questionnaires and IADL functional measure do support the convergent validity of their frailty.

3. The disability and physical limitations questionnaires may be strongly
correlated with the frailty measure, particularly items such as bending and walking 400 m. Do the authors feel there is any problem with collinearity or double-counting in their models?

4. The others note that there are more men than women in this study. Usually, we see the opposite. Do the others have any suggested reasons for this, as it may raise questions with readers?

5. The authors report that there was one gender differences in the study, on the social network type. I found the explanation of this result unclear and suggest that it could benefit from more explanation. (Page 12 line 288)

6. The study finds that non-frail people in the study more often had wider community networks, and that conversely frail people had more restricted networks. Were these associations adjusted for disability and/or health? One imagines that reverse causation maybe at play, with reduced ability to get out and participate in activities with others leading to having a more restricted network. This would be an interesting point for discussion.

7. There is limited discussion on the findings relating to the association between frailty and the psychological domain. The paper would benefit from some more discussion along these lines, as there has been some interesting work done in the literature on the psychological dimensions of frailty.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests.