Reviewer's report

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

Version: 2  Date: 18 March 2015

Reviewer: Matthew DL O'Connell

Reviewer's report:

This manuscript provides descriptive data on characteristics of frailty using a modified Fried scale among a sample of 8684 participants from the Health Monitor in Limberg. The major innovation of the work is the application of the frailty criteria to an ongoing large scale postal health survey and the study adds to the relatively limited literature on psychosocial correlates of frailty. The main limitation, alongside the cross-sectional design, is the purely descriptive nature of the analysis, particularly the lack of age adjustment for the associations described.

Major Compulsory Revisions

1) It is possible many of the associations described are explained by the older age of frailer participants. There is also a large gender difference across frailty categories with 61% of non-frail participants being male compared to 33% of frail. Conclusions from the paper would be stronger if they can be demonstrated to be independent of these demographic differences. Although the stratified analysis accounts for the gender point, the age point should be addressed further. For example, this can be tested reasonably well using linear regression for continuous outcomes and logistic regression for binary outcomes with indicator variables for frailty and sex and a continuous age term.

2) The manuscript would be improved by including more details in the data presentation. Tables 1 & 3 need a column for the p-values for each comparison and a footnote explaining which tests were used. The gender stratified analysis described on page 12 should be included as an additional table (or a table each for men and women) to allow readers to compare the results directly.

3) The direction of associations cannot be determined from this analysis. It is not clear whether increasing frailty leads to social isolation, loneliness, psychological distress or chronic conditions, or that these factors predispose people to developing frailty. It will be important to address this in future studies to inform screening and management: should people with these factors be screened for frailty or should these factors be assessed in frail people to improve quality of life? This limitation needs to be included in the limitations section on page 15. The implications section on this page makes some reference to these points, but should more clearly place them in the context of this important limitation.

Minor Essential Revisions
4) Abstract - Include some data in the results section eg %Frail/Prefrail, then some examples of the scores on the different health domains across categories

5) Introduction - Page 4 line 81-84 - the Fried frailty criteria were not designed as a self reported tool, although they have been adapted using self reported items for a number of studies eg Woods et al 2005, JAGS; Sirola et al 2011, J Nutr Health Aging. This section should clarify this point.

6) Introduction - page 5 line 105-110 - the justification for the study described here would benefit from some revision. More clarity about the hypotheses would help to put the results in context. Line 105 ‘might be helpful’ sounds weak and should be rephrased. Line 109-10 the meaning of the sentence ‘Moreover....is rather efficient’ is not clear to me.

7) Methods - Page 6 line 130-134 - For the sentences describing the analysis sample include the numbers with available data for participants over 65 years, questionnaires filled in by proxy and those with significant missing data

8) Methods - Page 6-7 line 151-166 - Are the questions used for the criteria taken from published/validated scales? If so please cite which ones

Discretionary Revisions

9) Results Page 10 line 253-254 - It would be interesting to describe which of the criteria drive the gender difference in frailty

Level of interest: An article whose findings are important to those with closely related research interests

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