Reviewer’s report

Title: Multidimensional structure of the Groningen Frailty Indicator in community-dwelling older people.

Version: 1 Date: 24 May 2013

Reviewer: Nienke M de Vries

Reviewer’s report:

Multidimensional structure of the Groningen Frailty Indicator in community-dwelling older people

In this manuscript, a study on the dimensionality, scalability and convergent validity of the Groningen Frailty Indicator (GFI) is described. The GFI was completed in a cross-sectional sample of older adults (n=1508). A subsample of this group (n=119) also completed questionnaires on loneliness, anxiety, depression, physical functioning and general health to determine convergent validity. The authors conclude that the findings support a three-dimensional factor structure of the GFI which can produce richer assessment of frailty.

This is a relevant subject in frailty research. Indeed, many frailty measurement instruments assess frailty based on the investigation of one dimension, while frailty is nowadays generally believed to be multidimensional in nature. When an instrument considers multiple dimensions, it is of great value being able to assess what the contribution of a specific dimensions to the total level of frailty is. The study was performed in a large sample and the methodology used is adequate. I do, however have some suggestions and concerns.

Major compulsory revisions

Background

1. The GFI is not the only frailty instrument that measures frailty on multiple dimensions. I would like to see a discussion in the introduction on how other measurement instruments deal with the multidimensionality of frailty? In addition, it is not clear to me what the purpose of measuring frailty is in relation to the multidimensionality. It is stated that the detrimental consequences of frailty can be prevented when early onset symptoms are recognized. Please explain what consequences can be prevented and which interventions can be applied (add references). Furthermore, It is not clear to me why an overall sum score is a problem. When an overall sum score indicates frailty, clinicians can easily see what domains are problematic.

2. Please indicate on what clinimetric properties the GFI has been tested in previous research.

Methods
3. Please describe in- and exclusion criteria of the study sample. Were, for example, cognitively impaired older adults excluded?

4. Please define multidimensionality, scalability and convergent validity. Is it correct that scalability can also be referred to as ‘structural validity’ (conform the cosmin checklist: Mokkink et al. 2010) and that multidimensionality is being studied by determining the internal consistency of the identified subscales? This is not clearly described and terminology is not being used consistently (sometimes ‘factor structure’ is used) Changing the terminology, could also be considered.

5. Considering convergent validity, hypotheses about the expected relationships between the GFI and other measures should be stated. Furthermore, it is stated that the questionnaires used to determine convergent validity are gold standards. Please indicate for what construct they are gold standards (frailty or individual dimensions).

Discussion

6. All analyses done indicate that the subscale Health Problems is a weak scale in the GFI. Please describe the consequences of this finding for the GFI and its’ clinical use.

7. Again, I would like to see a more specific comparison with other frailty instruments in the discussion. Is there agreement on the included dimensions? Also relate the findings to literature on frailty in general. How do these results relate to what is known on frailty?

8. The conclusion to consider someone only as frail when a person has a sum score of # 4 on the GFI and reports problems in all three domains of frailty is remarkable. Older adults do not necessarily have to experience problems in all frailty related domains to be considered frail. Please explain.

9. It is stated that this study did not assess sensitivity in detecting change of the GFI. Does this mean that the GFI is also proposed to be used as an evaluative measurement instrument?

Minor essential revisions

Introduction

10. First paragraph: change the sentence ‘due to an accelerated aging of the population’. Please change the word accelerated and specify the population.

Methods

11. Many paragraphs in the methods section contain information that should be described in the results section.
12. No conclusions on ‘the severity’ of problems can be drawn based on the GFI (first paragraph).

13. Describing frailty measurement instruments as ‘screening acceleration of age-related decline in functional capacity’ is not correct (second paragraph).

**Level of interest:** An article of importance in its field

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests