Author’s response to reviews

Title: IN-HOME PHYSICAL FRAILTY MONITORING: RELEVANCE WITH RESPECT TO CLINICAL TESTS

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Author’s response to reviews:

We would like to thank the editor and reviewers for their constructive comments, which have helped us improve the paper. Detailed replies are provided below for the comments of the two reviewers.

Response to Reviewer #1: Prof. Qian Li Xue, Ph.D.
Reply: We thank the reviewer for his useful and focused remark concerning the demographic and health characteristics. We added the table below: Table demonstrates both the mean and the standard deviation of the main items evaluated.

Table I. POPULATION CHARACTERISTICS

<table>
<thead>
<tr>
<th></th>
<th>Men (n=78)</th>
<th>Women (n=116)</th>
<th>mixt (n=194)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean ± SD</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>78.2 ±5.2</td>
<td>79.4 ±6.0</td>
<td>78.9 ±5.7</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>170.4 ±6.7</td>
<td>156.8 ±6.1</td>
<td>162.2 ±9.2</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>80.0 ±12.0</td>
<td>65.9 ±12.6</td>
<td>71.6 ±14.2</td>
</tr>
<tr>
<td>Activities of Daily Living (ADL)</td>
<td>5.8 ±0.4</td>
<td>5.7 ±0.4</td>
<td></td>
</tr>
<tr>
<td>Instrumental Activities of Daily Living (IADL)</td>
<td>5.8 ±2.1</td>
<td>6.8 ±1.8</td>
<td></td>
</tr>
<tr>
<td>Balance disorders (Berg’s scale)</td>
<td>52.1 ±4.2</td>
<td>50.4 ±6.4</td>
<td></td>
</tr>
<tr>
<td>Timed Up and Go test (TUG (s))</td>
<td>11.7 ±9.0</td>
<td>13.1 ±8.0</td>
<td></td>
</tr>
<tr>
<td>Mini-nutritional Assessment – Short form (MNA-SF)</td>
<td>9.4 ±1.9</td>
<td>9.0 ±2.0</td>
<td></td>
</tr>
</tbody>
</table>
Risk of developing pressure sores (NORTON’s scale) 19.5 ±1.1 19.3 ±1.1 19.4 ±1.1

Mini-geriatric depression scale (MINI_GDS) 0.4 ±0.8 0.9 ±1.1

Duke Health Profile (DUKE’s scale) 21.4 ±4.4 20.1 ±4.4

Comorbidity index (CHARLSON’s scale) 0.9 ±1.1 0.6 ±0.8

Walking speed (m/s) 0.8 ±0.5 0.7 ±0.4

Grip Strength (Jamar (kg)) 42.6 ±18.9 25.6 ±11.3 32.4 ±17.0

Time to walk 15 feet (s) 4.8 ±1.4 6.1 ±3.5

Data are mean ± standard deviation

2- It appears that, of the 194 subjects included in the study, there were only 6 people classified as frail by the Fried's phenotype and 7 by ARPEGE, and of the 8 classified as frail by either method, only 5 (63%) were in agreement. This is a significant limitation that needs to be mentioned in the discussion.

Reply: A substantial addition has been made to the discussion related to this significant limitation. We propose two hypotheses to explain why we have in our study only 8 people classified as frail. The first hypothesis concern the effects of subjects’ age, 194 participants were recruited from three different locations as it presented in the protocol section. It was limited to an age of 70 years and over, the age of subjects are distributed in percentage as: (66 % of subjects are aged <80 years ; 80 years < 34% of subjects are aged < 90 years). In this study, we noticed that six subjects among the eight classified frail, are aged greater than 80 years. Authors take this result into account before any new future recruitment could take place, for example: we can reverse the recruitment process (i.e. 66 % >80 years ; 34% < 80 years). The second hypothesis more probable than the first, in our opinion, this might be due to the strict cut-offs used in Fried conditions, especially for grip-strength and walking speed. In fact, the Fried cut-offs, were based on US community data from the CHS (Cardiovascular Health Study). In addition, it may be
useful to highlight what we observed about the difference in the average heights for example. There was a gap of about 2.6 cm for men and 2.4 cm for women between our subjects and Fried’s group. By adjusting the Fried cut-off for these two new values, we observed that 7.27% of our subjects passed from Not-frail to Frail. Hence, it may be preferable to associate data from several European geriatric centers in order to develop particular cut-offs for European populations.

This finding appears to specify that balance assessment might be useful, in combination with other efficient tests such as grip strength and walking speed, as a means of screening for frailty.

Response to Reviewer #2:

We would like to thank the reviewer for his thoughtful comments and efforts towards improving our manuscript, which help to improve the quality of this manuscript. Our response follows (the reviewer’s comments are in italics).
1- The authors have added an assessment of the performance of the tool to classify individuals as frail/robust, using Cohen's kappa coefficient. Although this has improved the article, they did not provide any information about their use of Cohen's kappa coefficient in the methods section, and added this result in the discussion section, but did not discuss it.

Reply: We thank the reviewer for his useful and focused remark about the correspondence between discrete frailty states from using the two approaches. In this manner, we followed the reviewer suggestion. A substantial addition has been made to the Data Processing section for providing the information concerning the Cohen's kappa test.

The Cohen's kappa test was performed using the Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA). P values less than 0.05 were considered to be statistically significant. The good agreements between the two approaches was assessed using the Cohen's kappa Test.

The observed proportionate agreement is 0.98
The expected probability that both would say YES at random is 0.001
The expected probability that both would say NO at random is 0.93
Overall random agreement probability is the probability that they agreed on either 0.94
The agreement between the two approaches k is 0.76

2- The table showed 188 participants out of 194 as not frail (97%), however no mention was made of pre-frail classification, which should be added. In addition, given the figures of grip strength and gait velocity, it would appear likely that the number of participants who were frail would be far greater than the 3% reported. However, if this were the case, it would negate the purpose of the article, as the overwhelming majority of participants were not frail."

Reply: We propose two hypotheses to explain why we have only 8 people classified as frail. The first hypothesis concern the effects of subjects’ age, 194 participants were recruited from three different locations as it presented in the protocol section. It was limited to an age of 70 years and
over, the age of subjects are distributed in percentage as: (66 % of subjects are aged <80 years; 80 years < 34% of subjects are aged < 90 years). In this study, we noticed that six subjects among the eight classified frail, are aged greater than 80 years. Authors take this result into account before any new future recruitment could take place, for example: we can reverse the recruitment process (i.e. 66 % >80 years; 34% < 80 years). The second hypothesis more probable than the first, in our opinion, this might be due to the strict cut-offs used in Fried conditions, especially for grip-strength and walking speed. In fact, the Fried cut-offs, were based on US community data from the CHS (Cardiovascular Health Study). In addition, it may be useful to highlight what we observed about the difference in the average heights for example. There was a gap of about 2.6 cm for men and 2.4 cm for women between our subjects and Fried’s group. By adjusting the Fried cut-off for these two new values, we observed that 7.27% of our subjects passed from Not-frail to Frail. Hence, it may be preferable to associate data from several European geriatric centers in order to develop particular cut-offs for European populations.

This finding appears to specify that balance assessment might be useful, in combination with other efficient tests such as grip strength and walking speed, as a means of screening for frailty.

N.B. A substantial addition has been made to the discussion related to this significant limitation.