**Author’s response to reviews**

**Title:** Unsupervised progressive elastic band exercises for frail geriatric inpatients objectively monitored by new exercise-integrated technology - a feasibility trial with an embedded qualitative study

**Authors:**

Camilla Rathleff (camilla.r.knudsen@gmail.com)

Thomas Bandholm (Thomas.Quaade.Bandholm@regionh.dk)

Erika Spaich (espaich@hst.aau.dk)

Martin Jørgensen (mgj@rn.dk)

Jane Andreasen (jaan@rn.dk)

**Version:** 2  **Date:** 18 Oct 2017

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Response to reviewers

Thank you for the opportunity to rephrase and improve the manuscript. We have carefully revised and reconsidered the two remaining reviewer comments in the following.

**Reviewer reports:**

Thank you for your response to the comments. There are two reviewer comments that may not have been sufficiently addressed, the first:

It seems that feasibility of implementation or of a future trial may be more affected by the presence of dementia than willingness to do unsupervised exercise. This is perhaps an important finding that would inform any future trial of exercise in this population - the need for an intervention that can be used in individuals with cognitive impairment.

Response: We fully agree on your point and acknowledge that dementia is a problem amongst the frail geriatric inpatients, however, in the present study we excluded patients with moderate to
severe cognitive impairment. As we write in the methods section, in- and exclusion criteria “…Patients were excluded if they had a low cognitive level defined as a score <5/10 on the Short Portable Mental Status Questionnaire (SPMSQ),…”. This is why we do not find that feasibility of implementation or of a future trial may be more affected by the presence of dementia than willingness to do unsupervised exercise in this case.

It seems you might have misinterpreted the reviewer’s point. The point is that you have excluded people with cognitive impairment, which is a relatively large proportion of the inpatient population. Therefore, your estimate of feasibility may actually be over-estimated compared to what could be achieved in the real world. You might consider including this as a limitation in the discussion.

Response: Sorry, we did misinterpret the reviewer’s relevant point, we have now included this in the limitation section.

Changes to text:

Strengths and limitations

A limitation to consider is that cognitively impaired were excluded in this trial. This may have the consequence, that the feasibility actually is over-estimated as a relatively large portion of geriatric inpatients in general are cognitively impaired. The time it took to recruit 15 patients at a 10-bed geriatric ward may support this.

The second:

At the end of the data analysis section please add a rationale for the sample size initially targeted and what it was.

Response: From the literature we have taken that standard sample size estimations are generally not used in the context of feasibility trials (e.g. Arain et al. BMC Medical Research Methodology 2010, 10:67 http://www.biomedcentral.com/1471-2288/10/67). This is why no formal sample-size estimation was done for this feasibility trial. Instead it was determined pragmatically with the purpose of estimating critical parameters (e.g. recruitment) to a necessary degree of precision as clarified by Arain et al. 2010. To meet the request we have added a paragraph regarding the
sample size for further elaboration. Changes to text: The sample size for this trial was determined pragmatically. It was possible to include participants for a period of 7 weeks, which we initially estimated to result in a sample of

10 to 20 participants. This was considered sufficient to assess feasibility.

Although a formal sample size calculation is often not necessary for a pilot trial, justification for the targeted sample size is important. For example, how do you know that 10-20 participants is enough to assess average adherence? It is not sufficient to say you recruited as many as you could in 7 weeks without justifying why 7 weeks, for example. You could justify how you know that the adherence in the 10-20 is reasonably representative of the adherence you might see in the larger sample that you eventually want to target. In other words, how do you know that you have estimated the critical parameters (e.g., adherence) to a necessary degree of precision as recommended in Arain et al?

Response: You definitely have a point. If we, for instance, had only recruited five patients in a 7 week period we would not have considered it sufficient regardless the 7 weeks had passed. We did actually carry out the study in 7 weeks instead of the initially planned 6 weeks to increase the number of included participants from the 10-bed geriatric ward. The 10-20 patients was considered appropriate to draw conclusions important for the planning of a future larger trial, because this number would most likely include patients with a variety of functional levels, attitudes towards training, resources, comorbidity and patients of both genders. Furthermore the rationale for a sample size of 10-20 was that this number was considered sufficient to assess the ability to execute the program as intended at the 10-bed ward, to test the ability and acceptability for the patients and the average adherence to the intervention. We expected that including 10-20 participants could make it possible to assess the proportion of eligible patients from the total number of patients at the ward, the proportion willing to participate, and also the proportion of patients who declined or dropped out.

Changes to text:

Methods, data collection and analysis

No formal sample size calculation was performed due to the descriptive character of the study and no efficacy testing was to be performed [38]. Approaches to sample size justification for pilot and feasibility trials vary greatly [39]. We aimed for a target sample size of 10-20 based on Julious (2005) [40], who recommends a sample size of 12 (per group) as a rule of thumb for a pilot study, and based on a 7-week inclusion period. If 12 participants were included before the
7-week inclusion period ended, we would continue to recruit until it ended, or until 20 participants were included.