Author’s response to reviews

Title: MOVING: A motivation oriented intervention study for the elderly in Greifswald: study protocol for a controlled, randomized trial

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Version: 1 Date: 17 Nov 2017

Author’s response to reviews:

We would like to thank the reviewers for their constructive comments, criticism and suggestions. We are convinced that they helped us improve our manuscript and clarify our message.

Reviewer #1
1. There is a large variation in the data from references regarding the decrease in PA with age (2.4 - 29%). The manuscript would benefit from a more descriptive display of this data, to justify such variation.

We added the following text in the manuscript (page 5): “The variation in the data can be explained by the fact that studies are conducted in different settings and the definition of elderly people is partly different. Furthermore, there are differences in the assessment of PA data. Some studies based on measured accelerometer data, other on self-reported data.” Another point is that there are different algorithms to classify the intensity of PA.

2. Background data is provided for Norway and US. Is data from Germany also available - that would be useful for planning the study in terms of assumptions and projections.
Thank you for this note. We added data from Germany in the manuscript (page 4): “In Germany, 19.3% of men and 16.8% of women aged 60-69 years achieved the WHO recommendations. In the age group 70-79 the amount of PA declines, 16.5% of men and 11.0% of women reach the recommended 150 minutes of moderate PA.”

3. Please define better permeant use of wheelchair

We added the following text in the manuscript (page 8): „no ability to walk independently”

4. Please justify the use of the 10K steps recommendations of WHO. Has this recommendation validated for the elderly population? Is this recommendation extended to apply to this age group?

Thank you for this note. We checked this again, the recommendation to do 10,000 steps a day comes from prevention programs in different federal states in Germany, not from the WHO. We corrected this in the manuscript (page 10): “10,000 steps, because this number is used in several prevention programs in Germany and well known in the population.”

5. Please provide the specific reference utilized and more details of the primary data used in the power calculation? Complete data generated by the power calculation should be provided.

We provided a more detailed description of the basis of the power calculation (page 11): “The sample size estimate was based on the amount of PA (mean time in minutes per day), measured in a comparable group of elderly people. In the used study the amount of PA was on average 15 minutes of combined PA (moderate and vigorous PA) per day. We took this data as the starting point for our estimation of the needed sample size.”

In order to assume the expected effect, we used data from the literature based on interventions in pedometer studies and added a section in the manuscript (page 5): “Furthermore a meta-analyses regarding the impact of pedometer-based physical activity interventions showed that the use of pedometers has a moderate positive effect on PA (an average increase of 2,000 steps per day. A systematic review about the usage of pedometer interventions showed similar results. Participants increased their PA by 2,491 steps per day in comparison to the control group.”

6. I believe that the statistical analysis of the outcome data need a more detailed description.

We added more information in the manuscript to the data analyses (page 12).

Reviewer #2
P4L82 "musculoskeletal apparatus" would be better phrased as "musculoskeletal system"

We changed this in the manuscript
Power calculation: I believe the authors are describing that they expect baseline levels of PA to be 15min per day; however this sentence could be more clearly written.

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P10L243 "there" should be "their"
We changed this in the manuscript

P11L284-5 "receive two times individualised feedback" would be better as " twice receive individualised feedback"
We changed this in the manuscript

In the Abstract, it would add clarity if the desired increase in PA and reduction in ST were specified.
We added the following section to the abstract (page 2): “We aim an effect of 20%.”

There is an excellent description of international PA levels but it may be useful to cite any results about PA levels and sedentary time that are available for German population.
Thank you for this note. We added data from Germany to the manuscript (page 4): “In Germany, 19.3% of men and 16.8% of women aged 60-69 years achieved the WHO recommendations. In the age group 70-79 the amount of PA declines, 16.5% of men and 11.0% of women reach the recommended 150 minutes of moderate PA.”

The paper would benefit from a description of the "low threshold" that is used to determine who should receive the intervention.
We characterized the features of the intervention and added the following section to the manuscript (page 10): “We developed a low-threshold intervention characterized by easy access to the intervention and a low effort for the target group.”
The article would benefit from referring to the wider literature that exists about these type of interventions, including the work of Darker et al (2010 Psychology & Health), French (including his protocol published in 2011 in BMC Family Practice), Baker et al (IJBNPA 2008) and the systematic review published by David Ogilvie et al (BMJ 2007). There is a significant evidence base delineating the importance of using Behaviour Change theory to inform intervention design and understanding the constructs that an intervention is intending to change to facilitate the patient to engage in the intervention. The Behaviour Change Taxonomy (Michie 2011 Psychology & Health) has been specifically developed to allow accurate description of interventions to allow understanding of the "active ingredient" of these types of interventions and I would encourage the authors to review this and cite it within the results paper, if not in this paper. This theory base is touched on by the sections describing self-efficacy, but would benefit from further development and is currently not referenced at all.

Thank you for this note. We reviewed the recommended literature and added the following section to the manuscript (page 5): “Interventions in promoting PA should consider behavioral change aspects. A systematic review regarding interventions to promote walking identified two general characteristics of effective interventions. These aspects are targeting and tailoring and involve participants’ requirements or circumstances.”

For further research we will focus on behavioral change aspects and use the recommended literature (Michie 2011) for the results paper.

P8 L201 refers to "general information and recommendations" but details of this is sparse. Again this comment links in with ensuring active elements of the intervention are accurately described - is this solely education material? does it facilitate the patient to set goals?

We have specified the general information and added the following section to the manuscript (page 11): “Additionally, participants receive leaflets with age-appropriate recommendations for PA at baseline. The leaflets are from the Federal Centre for Health Education.” This is education material and does not contain any goal settings.

I would suggest that perhaps the details of how data is stored and protected could be trimmed, but it might be useful to then expand the section describing the accelerometer data analysis and detail which variables are to be used - is all PA to be measured? or just MVPA? how will a period of sitting time be defined? what sampling interval will be used? etc etc

We have specified the information to the accelerometer data and its categorization and added the following texts to the manuscript (page 12): “To categorize PA intensity, we used specific cut points based on Freedson. PA is divided into sedentary (0–99 steps), light (100 – 1951 steps), moderate (1952 – 5724 steps) and vigorous (5725 – 9498 steps) PA. Step counts are based on 60 second epochs.”

How are the "personalised feedback" letter generated? On what basis are the recommendations calculated?
The feedback letters are based on real accelerometer data and automatically generated in R software.

We added the following text to the manuscript (page 10): “The intervention comprises two individualized feedback letters, automatically generated in R software (version 3.3.2, Lucent Technologies, Murray Hill, New Jersey, USA) from the study data base using the variables “number of steps per day”, “time in minutes of moderate and vigorous PA” and sedentary time in minutes per day. We compare the individually measured PA data of the study participants with the recommendations for PA of the WHO and report back the difference between them.”