Reviewer’s report

Title: Developing a measure of muscular power during a functional task for older adults

Version: 2

Date: 18 September 2014

Reviewer: Ulrich Lindemann

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Developing a measure of muscular power during a functional task for older adults

This study describes a measure to assess power during a functional task, which is highly relevant for older adults. Unfortunately, the statistics used in the study are not appropriate, but can be recalculated.

Major compulsory revision: MCR
Minor essential revisions: MER
Discretionary revision: DR

Corresponding author
MER - Please add USA to authors’ affiliation.

Abstract
MCR - How do you define a field test? You can use a body-fixed sensor (your reference 38 and 43) wherever you want to!
DR - I would prefer not to mention the name of the device in the abstract, but to describe it.
DR - You do not need to include the statistical methods in the abstract. I recommend to delete.
MCR - Giving the p-value I suppose you used a Wilcoxon test to assess agreement between Tendo and Vicon. This is definitely not a correct statistical method!

Background
MCR - There is no red line in your introduction: Your start is good, but should move the description of decline of power (your ll. 88f) to line 75.
MER - I suppose that chronic diseases (ll. 75-77) are not relevant here.
MER - The association between physical activity and falls also is not what you really want to tell us, but the association between falls and power is (ll. 89, 90).
MCR - In the abstract you state that there are no field tests, here you say that there are few!?

Methods
Experimental approach

MCR - This paragraph should be deleted and its content should be presented in Subjects (and Design) and Statistics.

Subjects

MCR - Please include here the design of the study.

MCR - What were your inclusion criteria?

Table 1

MCR - More relevant than body fat is muscle mass!

MCR - Both, Tendo and Power are given in W/kg. Without reading the text the table should be understandable. Please explain this in the notes.

MCR - Please recalculate the p-values using non-parametric Wilcoxon test (see statistics)

Procedures

MCR - Here, you describe your descriptive variables. The results should be given in Table 1.

MCR - Please give a reference for the health history questionnaire.

MCR - Please indicate the outcome variables of the DXA.

Muscular power

MCR - The method of the Tendo is not clear. You have to describe, how it works!

MCR - STS is movement where the COM goes upward and forward. Attaching the Kevlar string in the sagittal plane (why plane? Should be direction, right?), you measure the forward movement, right? I suppose that the upward movement is more relevant. Using a string I suggest that the Tendo measures both directions. A figure would be helpful here.

MCR - Is the relative power calculated from the body weight or from DXA muscle mass (preferable)?

MCR - You do not measure COM here (ll. 157-166)!

MCR - I suppose that also for the Vicon measure a figure would be helpful.

DR - Please indicate USA, but not CO and MI to describe the tools. The world is more than only USA!

MCR - What is the rational for using body weight, but not DXA muscle mass for calculating power?

Statistics

MCR - Statistical methods are not appropriate: since you have a small sample size, non-parametric measures are recommended: please use median and IQR to describe variables and Wilcoxon test to test for differences (gender). Instead of a test for differences between measures (you want to show agreement, which you cannot show with these tests), you should test the association (here
Spearman’s r).

Results
MCR - Recalculate all results with appropriate measures.
MER - Delete Figure 1.

Discussion
MCR - With regard to the Nottingham Power Rig, I do not know the price of the Tendo, but the NPR is about 15,000 Euro. I think differences between NPR and STS/Tendo are that NPR measures only leg power, Tendo full body power and that at the NPR punctum fixum and punctum mobile is not as it is during STS/Tendo (this could be related to the aspect of balance or better coordination.
MCR - In my study (II. 215-219) we used force plates, but not cinematography.
MCR - Please add limitations of your study (small sample size, only healthy persons, …).

Practical application
MCR - Again, there is a valid and cheap field measure to assess power during STS (Zijlstra)!

References
DR - There is one reference double (Zijlstra 38/43) and some in the text are not in the list of references.

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

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**
I declare that I have no competing interest