Author’s response to reviews

Title: Controlled, cross-sectional, multi-center study of physical capacity and associated factors in women with fibromyalgia.

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Author’s response to reviews:

Point-by-point response to comments from reviewer 1

Comments from reviewer 1 We would like to thank reviewer 1 for valuable comments. Please find the changes made in the manuscript marked in yellow.

It is unclear whether you wish to investigate muscle strength or physical capacity.

In some aspects of the paper physical capacity and muscle strength are used as synonyms, while in other parts of the paper walking ability is included in the term. You need to clarify what you mean by physical capacity and use it consistently throughout the paper. Thank you for pointing this out, we have now clarified the use of the terms physical capacity, muscle strength and walking ability throughout the manuscript.

The introduction is quite wordy and should be written more efficiently. Example: (P5L21-23) "...Physical capacity refers to aerobic capacity, muscle strength, flexibility and balance and
influences the ability to manage tasks of everyday living [11]. One aspect of physical capacity is muscle strength...".

We have now written the introduction more efficiently on page 5-6.

Your presentation of the literature on muscle strength in FM is one-sided. You should also mention that there are studies finding normal muscle strength in the FM population. We have carried out a literature search on muscle strength in fibromyalgia and the studies that have calculated differences between patients with FM and healthy counterparts report that patients with fibromyalgia have reduced muscle strength compared to healthy women (Goes 2012, Mannerkorpi 1994, Maquet 2002, Okumus 2006, Meningshoel 1990, Norregaard 1997, Borman 1999.) However, a publication report that half of the patients had near normal muscle strength (Henriksen 2009).

We have now included this information in Introduction, page 5.

I find that the 3rd paragraph on page 6 (L19-36) does not contribute to the story you trying to tell in the introduction. For instance, as sarcopenia is often related to frailty and the elderly population, I think that including sarcopenia in this present study is redundant. We have now omitted the sentence regarding sarcopenia on page 6: Muscle strength decreases also with increasing age due changes in body composition, leading to increased fat mass and age related loss of muscle mass. This age-related loss of muscle mass leads to reduced strength and thus decreased physical capacity

In the methods you report that potential participants were excluded if they had other concomitant diseases. As the FM populations often have several health related problems, you might have a biased sample. If you excluded specific diseases (e.g. cardiovascular diseases, cancers....) please specify in the text. Further, what were the exclusion criteria for the healthy women? We have now clarified this on page 7: Exclusion criteria included high blood pressure (>160/90 mmHg), osteoarthritis (OA) in hip or knee, confirmed by radiological findings, other severe somatic or psychiatric disorders or other dominating causes of pain than FM.

Your matching procedure is unclear. We have now clarified this on page 8: The patients and healthy controls were individually matched according to age and education. Initially, the
participants were classified into 5-year age groups, while the education categories were based on
the exact number of years of education received. After this matching process, additional patients
in the education level 10-12 were included. The final study sample comprised 118 women with
FM and 93 healthy women. The difference in mean age between the two groups was only 0.2
years (p=0.91) and the percentage difference in education level was less than 15% (p=0.33),
Table 1.

The paragraph on "Measures of physical capacity" (P9) is very long and quite repetitive. This
should be written more efficiently.

We have now shortened the paragraph regarding measurements of physical capacity on page 9
and 10.

At page 10, line 2: please specify the length of the walkway.

We have now specified the length of the walkway on page 9: The test was performed along a 30
meter long, straight corridor…..

Please justify the choice of including both mean (SD) and median(min:max) in your descriptive
statistics.

Median and (min:max) has now been removed from Table 1 and Table 2.

In the introduction it is suggested that the reduced physical activity level might contribute to
reduced muscle strength in women with FM (P6 :L2). You also try to explain your result with
reduced activity (P15, L12). Physical activity level is reported in the present study, but only
descriptively.

You make repeated assumptions about the role of physical activity level, without doing the
proper analysis. Since physical activity level data is available, it should be controlled for when
comparing physical capacity between FM and healthy women.

We have now removed the assumption that physical activity level might contribute to reduced
muscle strength throughout the manuscript.
Reporting of activity limitations. There is an inconsistency between the method and result section regarding assessment of activity limitations. In the methods it is stated that activity limitations was assessed by SF-36, while in table 1 FIQ score is reported.

We have omitted the term Activity limitations from Table 1.

Why do you choose to report Isometric elbow-flexion force in kg, while the other strength outcomes are in N? Force is also measured in N (not kg), and it would read better if all strength variables were represented in the same unit.

All strength outcomes are now presented in the same unit. See Table 2-4.

Discussion: See general comments

We have shortened the discussion and written it more efficiently on page 14-17

The information in first paragraph of page 15 is already stated in the introduction. We have now rewritten the first paragraph on page 15.

In the 4th paragraph at page 16 (L.51-) you compare your healthy group with reference data. I think it would be more interesting to compare your FM group with the reference data.

We have shortened this paragraph but prefer to keep it. Comparison of FM group with reference data is presented above this paragraph on page 14-15.

You continue your discussion in the conclusion. Please keep the conclusion short and concise. The conclusion on page 17 is now considerably shortened and more concise.

The language is at times a bit cumbersome. I recommend that you arrange for your manuscript to be evaluated by someone with English as their native language.

The manuscript has been evaluated by someone with English as his native language.

Point-by-point response to comments from reviewer 2

Comments from reviewer 2
We would like to thank reviewer 2 for valuable comments. Please find changes made in the manuscript marked in yellow.

Abstract: lines 1 & 5 "associated to disease" would be better as "associated with disease” Thank you for your suggestion. The sentence in the abstract on page 3 has now been changed to: Health and physical capacity are commonly associated with disease…..

Line 3 "The" should be inserted before "secondary aim"; second-last line recommended "to" be routinely assessed

Thank you for pointing this out. We have made the changes suggested in the abstract on page 3.

BMI and a number of other measures are listed but not stated how these were collected - i.e. self-report or?

We have now clarified this on page 8 and 9: Background data were collected through interviews and self-reported questionnaires. The collected data included age, symptom duration, education (≤9 years, 10-12 years, >12 years), family status (living with an adult, yes/no), and country of birth (born in Sweden, yes/no)……

The participants were also asked about pharmacological treatments (NSAIDs, Paracetamol yes/no, Opioids for mild to moderate pain yes/no, Antidepressants yes/no, Anticonvulsives yes/no, Sedatives yes/no). Height and weight were measured and BMI [weight (kg) / height (m)2] was calculated. Clinical assessment of tender points was carried out by manual palpation.

Could explain the starting position for maximal elbow-flexion force - i.e. forearm pro/supination or mid position?

Thank you for your suggestion, we have now added this on page 9: The upper arm was aligned with the trunk and the elbow was placed in 90° of flexion, forearm supinated.

Could state where data collection took place and whether all in one day and the order of tests and rest periods - particularly as fatigue is an issue in fibromyalgia.

We have now clarified this on page 8 and 9: Examinations were conducted at physiotherapy clinics in Gothenburg, Linköping and Stockholm. Performance based tests of muscle strength
and walking ability are presented below in the order they were performed. There was a one minute rest between each trial as stated in the descriptions of the test procedures. No additional rest periods were planned between different tests of muscle strength and walking ability, the participant rested during the time it took to prepare the next test.