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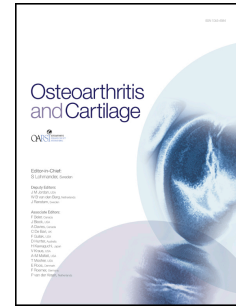
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Response to the comments on “Effects of high intensity aquatic resistance training on body composition and walking speed in women with mild knee osteoarthritis: a 4-month RCT with 12-month follow-up”

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2 Letter to the editor:

3 **Response to the comments on “Effects of high intensity aquatic resistance training on body**
4 **composition and walking speed in women with mild knee osteoarthritis: a 4-month RCT with 12-**
5 **month follow-up”**

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13 We thank you for taking an interest in our recent article and spending the time to evaluate its
14 content at such depths. A number of important aspects have been raised and we will strive to
15 answer them fully in order of the original letter.

16 Most participants in randomised controlled trials (RCT) are volunteers, which is the most common
17 recruitment method in this field¹. In daily practice, the adherence of most patients may not be as
18 high as in RCTs. This introduces a selection bias preventing the generalization of results from RCT's
19 to real life daily. In our study, recruited participants are women with mild knee osteoarthritis (OA),
20 thus they are preclinical. Recruitment of this population would be difficult using another method.
21 We would like to highlight that there was no inclusion criteria for enthusiasm. Participants did have
22 to give written consent to be randomised into one of the two treatment arms, as is normal for RCT
23 studies. We hypothesize that the training, its delivery, i.e., skilled instructors, the group dynamics
24 and enjoyment were also, in part, a positive reason for the high adherence.

25 The primary outcome for our SQUAREHAB project was the biochemical composition of cartilage with
26 symptoms and functional capacity as secondary outcomes. The results of the primary outcomes are
27 reported in our earlier article². The previously validated 2km walking test uses the calculation $(116.2$
28 $- 2.98 \times (\text{walking time, min}) - 0.11 \times (\text{final heart rate}) - 0.14 \times (\text{age}) - 0.39 \times (\text{body mass index}))$ to
29 estimate cardiorespiratory fitness³. Walking speed, calculated from walking time, was the preferred
30 outcome in this study as it represents the participants' functional capacity and is not an estimation.
31 Exclusion of this clarification from the study protocol was an oversight on behalf of the authors.

32 As pertained to in the introduction of the original article⁴, training for 3 hours a week leaves plenty
33 of time per week for other leisure time physical activities (LTPA), that could easily affect both
34 cartilage health as well as functional capacity and body composition⁵. In previous aquatic exercise
35 studies, LTPA is not reported. Throughout our study, LTPA was similar in both groups after exclusion
36 of the intervention. Adjusting for LTPA or baseline values did not change the overall results of the
37 primary analysis. We did not include the adjustments for baseline or LTPA values due to the clear

38 group homogeneity. We were also interested if overall LTPA over the 16 months study period was
39 more important for the chosen outcomes in this paper, than inclusion in a 4-month intervention. The
40 results of the secondary analysis suggest that while higher levels of LTPA, in part, has an effect on
41 body composition, walking speed, i.e. functional capacity needs to be separately trained. However,
42 we acknowledge in our discussion, there are many other factors including diet that might have
43 influenced the results.

44 The description of each training session is reported in the supplementary data of our previous article
45 and includes the minor change of one session from resisted to barefoot training from the protocol
46 study². Clarity and openness of reporting the intervention content, allowing accurate replication, is
47 rarely achieved in aquatic exercise studies. The high adherence and group dynamics ensured that all
48 participants trained within the target heart rate zone, preventing differentiation between those who
49 trained at low and high intensities.

50 The included population, i.e. women with mild knee OA, are situated earlier in the OA continuum⁶
51 than those included in the referred Cochrane review⁷. Therefore, care must be taken before making
52 a direct comparison due to different study populations as well as research questions asked. The
53 degree of pain and functional impairment experienced by the subjects at recruitment in the
54 dimensions of the Knee injury and Osteoarthritis Outcome Score (KOOS) questionnaire were so low
55 did not expect to observe a significant change. The management of knee and hip OA is changing,
56 there is a shift from treating pain and loss of function at the end stage of the disease to management
57 systems that to prevent it in early OA. Therefore, we did not claim this to be a treatment but as a
58 possible exercise option in the management of early knee OA and possibly help in disease
59 prevention.

60 Modern healthcare professionals need a variety of evidence based exercise options available to
61 choose from, with patient choice being central in treatment selection. Aquatic resistance training is
62 just one of those options, there is no such one size fits all in exercise prescription. The high

63 adherence to the training suggests that, at least in women, the training modality is popular. Aquatic
64 exercise is recommend to those who cannot exercise on land due to pain; therefore, it is reasonable
65 to suggest this is also a viable intervention in the treatment of later stage osteoarthritis.

66

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68 No other authors

69

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72

73 **Conflicts of interest**

74 No conflicts of interest

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