Author's response to reviews

Title: Swimming performances in long distance open-water events with and without wetsuit

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BMC Sports Science, Medicine and Rehabilitation
Prof. Dr. Fernando Marques
Editor-in-Chief

Dear Prof. Marques

MS: 1168184054112245
Swimming performances in long distance open-water events with and without wetsuit

We thank you for your e-mail from April 16, 2014.

Find below the answers to the questions raised by the reviewers.

All changes are marked in red in the revised manuscript.

We saw that we had not inserted the results of the annual fastest swimmers as reported in the methods and statistical analyses; this is now inserted to be
consistent with the existing discussion of the change in performance of the annual fastest swimmers.

We hope the revised manuscript will be suitable for publication in BMC Sports Science, Medicine and Rehabilitation.

Yours sincerely,

Beat Knechtle

Enclosure: Manuscript via central website

EDITORIAL REQUIREMENTS:

*Please include the email address of all authors in the title page.
Answer: We inserted now all e-mail addresses on the title page.

*Competing interests: Please include a 'Competing interests' section between the Conclusions and Authors' contributions. If there are none to declare, please write 'The authors declare that they have no competing interests'. Please consider the following questions and include a declaration of competing interests in your manuscript:

Financial competing interests

? In the past five years have you received reimbursements, fees, funding, or salary from an organization that may in any way gain or lose financially from the publication of this manuscript, either now or in the future? Is such an organization financing this manuscript (including the article-processing charge)? If so, please specify.

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Non-financial competing interests

? Are there any non-financial competing interests (political, personal, religious, ideological, academic, intellectual, commercial or any other) to declare in relation to this manuscript? If so, please specify.

Answer: We inserted now that we had no competing interests.

*Authors’ contributions: Please include an Authors’ contributions section before the Acknowledgements and Reference list.
For the Authors' contributions we suggest the following kind of format (please use
initials to refer to each author’s contribution): AB carried out the molecular genetic studies, participated in the sequence alignment and drafted the manuscript. JY carried out the immunoassays. MT participated in the sequence alignment. ES participated in the design of the study and performed the statistical analysis. FG conceived of the study, and participated in its design and coordination. All authors read and approved the final manuscript.

An "author" is generally considered to be someone who has made substantive intellectual contributions to a published study. To qualify as an author one should 1) have made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; 2) have been involved in drafting the manuscript or revising it critically for important intellectual content; and 3) have given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content. Acquisition of funding, collection of data, or general supervision of the research group, alone, does not justify authorship. All contributors who do not meet the criteria for authorship should be listed in an acknowledgements section. Examples of those who might be acknowledged include a person who provided purely technical help, writing assistance, or a department chair that provided only general support.

*Acknowledgements: We strongly encourage you to include an Acknowledgements section between the Authors? Contributions section and reference list. Please acknowledge anyone who contributed towards the study by making substantial contributions to conception, design, acquisition of data, or analysis and interpretation of data, or who was involved in drafting the manuscript or revising it critically for important intellectual content, but who does not meet the criteria for authorship. Please also include their source(s) of funding. Please also acknowledge anyone who contributed materials essential for the study.

Authors should obtain permission to acknowledge from all those mentioned in the Acknowledgements. Please list the source(s) of funding for the study, for each author, and for the manuscript preparation in the acknowledgements section. Authors must describe the role of the funding body, if any, in study design; in the collection, analysis, and interpretation of data; in the writing of the manuscript; and in the decision to submit the manuscript for publication.

Answer: We inserted now the authors’ contributions. There are no acknowledgements.

Reviewer’s report

Title: Swimming performances in long distance open-water events with and without wetsuit
The paper “Swimming performances in long distance open-water events with and without wetsuit” aimed to investigate the influence of wearing a wetsuit on swimming performances at the 26.4 km ‘Marathon Swim in Lake Zurich’ in Lake Zurich, Switzerland, and the 3.8km Lake Ontario Swim Team-Race (LOST-Race) in Lake Ontario, Canada”.

Main data seems to suggest that wearing a wetsuit could have a positive influence on swimming speed for both women and men but the benefit of the use of wetsuits seems to depend on additional factors like race distance. Moreover, in long-distance open-water swimming women seemed to benefit more from wearing wetsuits than men.

This study is very interesting and is within the scope of the journal. However, there are some issues that should be addressed, that are not so clear during the paper.

Major Compulsory Revisions:

1. Abstract. Please rephrase the results section in the abstract. It is somewhat confusing for the reader. Please check also the conclusion according to the final remark.

   Answer: We agree with the expert reviewer and adapted the results section in the abstract following the changes in the results.

2. Introduction. Although the study focus on open-water events and the effects of wetsuits, when analysing the effects of wearing suits on performance, even in swimming pool conditions, please discuss deeper this issue, referring to some recent studies regarding this aim.

   Answer: We agree with the expert reviewer and expanded the aspect of performance while wearing a wetsuit. We inserted the following aspects “The performance gain while wearing a wetsuit was associated with propulsion efficiency related to both a gain in buoyancy and drag reduction. It seemed that swimming performance improved more in inefficient swimmers with low buoyancy and swimming at low speed. Additionally, wearing a wetsuit reduces drag during front crawl swimming leading to a decreased energy cost of submaximal swimming and an increased distance per stroke. Differences do also exist between fastskin and standard swim wetsuits regarding drag and buoyance where full-length, fastskin swimsuits created less total hydrodynamic resistance than normal swimsuits while providing no additional buoyancy benefits. Also a torso swim suit and a standard racing suit also lead to differences in drag and performance. A torso suit reduced the energy demand of swimming whereas a
standard racing suit reduced body drag. Also the length of the swimming performance seems of importance where performance was not enhanced in rather short swimming distances'.

3. Results. Data are very interesting and with very good figure presentation. However, data explanation is not so well written, and some parts may be difficult to follow.

Answer: We agree with the expert reviewer and improved the presentation of the results

3.1. For instance, when referring to figure 2b: “Male top three (401.6±7.2 min versus 396.4±28.8 min, 1.2%, p>0.05) and male top ten swimmers (412.6±9.02 min versus 434.2±31.8 min, 5.2%, p<0.01) without wetsuits swam faster than female swimmers without wetsuits”. This sentence is not completely true. Male top three did not swim faster than female swimmers without wetsuits.

Answer: We agree with the expert reviewer and corrected the error for top ten swimmers.

3.2. Please rewrite this section, allowing clear information for the reader, underlying main data from the figures, as reported in the Lost Race section.

Answer: We agree with the expert reviewer and improved the presentation of the results

4. Discussion. It has been reported that wetsuits lift the body in a more horizontal position by providing higher buoyancy. However, when we analyse the compression of the body due to the suit, one can expect that buoyancy could decrease (as body mass is the same but body volume is lower). Can you comment on that please?

Answer: We agree with the expert reviewer and inserted a section ‘It is known that wetsuits lift the body in a more horizontal position by providing higher buoyancy. However, when we analyse the compression of the body due to the suit, one can expect that buoyancy could decrease as body mass is the same but body volume becomes lower. Regarding this aspect, buoyancy may decrease in both women and men. The reduction might be relatively higher in men with lower body fat then in women’ in the discussion

5. Discussion. Authors presented an interesting explanation for different training and body profile of swimmers and triathletes. It would have been very interesting to characterize the participants in the study according to their specialized training, to understand if the ones participating without wetsuit would be better prepared for these race events. Is it possible?

This was mentioned in the limitations of the study, which is very important for the reader, although some comment on that (and possible solutions to solve the lack of available data) could complete the remark.

Answer: We agree with the expert reviewer and inserted results from studies with long-distance swimmers and Ironman triathletes regarding their swimming training. We inserted a section with ‘It has been reported that female and male
long-distance open-water swimmers competing in ‘Marathon Swim’ in Lake Zurich swam 16.2±8.5 and 15.6±13.3 km weekly, respectively, at a mean speed of 3.4±0.6 and 3.5±0.5 km/h, respectively. In contrast, female and male Ironman-triathletes swam 5.5±2.4 and 6.7±3.0 km weekly, respectively, at a mean speed of 2.1±0.8 and 2.7±0.6 km/h, respectively. Most probably, also swimmers competing in a 3.8-km swim will train less that ultra-swimmers competing in a 26.4-km ultra-swim’.

6. Discussion. Some explanation is presented to explain why female swimmers would benefit more of using the wetsuit (in LOST Race). Nevertheless, female swimmers have lower muscle mass and higher fat mass than male swimmers, so it would be expected to present a more stable horizontal position in the water, due to better buoyancy capability. So, maybe wetsuits could be more beneficial for male swimmers. Don’t authors agree with this argument?

Answer: We agree with the expert reviewer and addressed this aspect by inserting a section ‘Female swimmers have lower muscle mass and higher fat mass than male swimmers, so it would be expected to present a more stable horizontal position in the water due to better buoyancy capability. On the other side, men have lower body fat and a higher muscle mass, so maybe wetsuits could be more beneficial for male swimmers. Indeed, Cordain and Kopriva suggested that the increase in performance by the increase in buoyancy might be of more benefit for leaner than for fatter subjects. This consideration might also be supported by the very recent finding that female open-water ultra-swimmers competing in the 46-km 'Manhattan Island Marathon Swim' with water temperatures <20°C were faster than male swimmers. One might argue that men wearing a wetsuit might be faster than women in this specific race'.

In the next paragraph, when referring to the Marathon swim, the statistical problem is a good argument, but one can wonder if the buoyancy question could be raised again. Please comment on that, and rephrase this section accordingly, if required.

Answer: We agree with the expert reviewer and inserted ‘Future studies would need to compare swimming performance in open-water ultra-distance swimming of distances of ~50km at water temperatures <20°C. Men with lower body fat might benefit from wearing a wetsuit under these conditions’.

7. Conclusion. Authors started the conclusion with: “The present results suggest that swimmers competing in long and ultra-long-distance open-water swims could benefit from wearing wetsuits. This is consistent with existing literature reporting better performances of swimmers wearing wetsuits while swimming in indoor pools on short to middle distances”.

However, Discussion section starts with: “The most important finding was that open-water swimmers wearing a wetsuit were not generally faster in both the long and the ultra-long-distance swimming event than swimmers without wearing wetsuits. This finding contradicts existing literature [18, 20] reporting better performances for swimmers wearing wetsuits on short to middle distances between a standardized 500m test track and 1,500m”. It seems there is a lack of
coherent findings when it is presented like this. Please correct this concern, accordingly. See also the abstract.

Answer: We agree with the expert reviewer and adapted the section in the discussion to ‘The most important finding was that open-water swimmers wearing a wetsuit were not generally faster in both the long and the ultra-long-distance swimming event than swimmers without wearing wetsuits depending upon whether the fastest, the three fastest or the ten fastest swimmers were considered’. We also adapted the conclusion accordingly.

Minor Essential Revisions:

1. Results. Sometimes is used “vs.” and others “versus”. Please use always the same word/symbol.

Answer: We agree with the expert reviewer and used ‘versus’ throughout the results to be consistent.

2. Discussion. Please insert “to” after “the aim of the study was”.

Answer: We agree with the expert reviewer and changed as suggested

3. Discussion. Change “therefor” to “therefore”.

Answer: We agree with the expert reviewer and changed as suggested

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Answer: We agree with the expert reviewer and the manuscript was checked again for English spelling. All changes are marked in red.

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests: I declare that I have no competing interests
Reviewer's report:

Major Compulsory Revisions

The aims and the hypotheses are not consistent. There is no hypothesis for the influence of sex, only the influence of wearing a wet suit. Otherwise well analysed and written. It is up to the Editor to determine if the new knowledge is sufficient to warrant a full publication, I have not fully convinced.

Answer: We agree with the expert reviewer. Based upon very recent findings, we adapted the hypotheses to ‘We hypothesized that (i) swimmers wearing a wetsuit would finish the races in a shorter time than swimmers without wearing wetsuits and (ii) women might be able to outperform men in the longer race distance’.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Answer: We agree with the expert reviewer and the manuscript was checked again for English spelling. All changes are marked in red.

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests: 'I declare that I have no competing interests'