Author’s response to reviews

Title: Cross-sectional associations between variations in ankle shape by statistical shape modeling, injury history, and race: the Johnston County Osteoarthritis Project

Authors:

Amanda Nelson (aenelson@med.unc.edu)
Yvonne Golightly (golight@email.unc.edu)
Shahmeer Lateef (shahmeer_lateef@med.unc.edu)
Jordan Renner (jordan_renner@med.unc.edu)
Joanne Jordan (joanne_jordan@med.unc.edu)
Richard Aspden (r.aspden@abdn.ac.uk)
Howard Hillstrom (hillstromh@hss.edu)
Jennifer Gregory (j.gregory@abdn.ac.uk)

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Author’s response to reviews:

Thank you for further considering our paper and revision. We have attempted to address the remaining comments as follows:

EDITORIAL COMMENTS

1. Please remove unnecessary capitals from title, i.e: Cross-sectional associations between variations in ankle shape by statistical shape modeling, injury history, and race: the Johnston County Osteoarthritis Project

Done.

...and ensure this change is made to BOTH the manuscript file and online submission system text box.

Done.

2. Please move square reference brackets BEFORE punctuation, not after, eg:
...compared with healthy controls [21].

 NOT

...compared with healthy controls.[21]

Done.

Reviewer reports:

Reviewer #1: Thanks to the authors for the punctual reply to my observations. Few finale notes where felt necessary.

Thank you for your thoughtful comments.

2 - Although the scanning process is now more clear, some further detail on how the patient is told to stand within the scanner will help. Is the alignment functional (stand as you are more comfortable)? There is any control on the foot-tibia angle, for instance by means of a rig? It is not just a matter of how the x-ray camera is positioned, but also how the subject stand within the field of view.

Author response: The only direction given to the participants when obtaining the radiograph is to stand with equal weight on both feet, and with the foot parallel to the cassette (as noted on page 5). No additional instruction or physical controls are in place for the x-ray acquisition.

Changes made: We have already acknowledged the potential limitations of positioning on page 10, “and differences in positioning could contribute to the observed variation,” so no further edits were made.

3 - Same as previous point.

6 - The proposed analysis is appealing since it aims at providing a valuable clinical tool that relay on common medical images. However, the simplification imposed by the 2-dimensionl representation or articular surfaces may rise some doubts about the effectiveness of the proposed approach. A validation of the same on a smaller population with 3D data could highly support the obtained results.

Author response: We agree that a validation study with 3D data would be very interesting and supportive of our findings. However, this is out of the scope of the current project and would require substantial additional resources and funding to accomplish. We also feel that the current work is a worthwhile contribution to the literature on its own, and further validation, both through 3D analysis and in other populations, could be done after publication.

Changes made: Edited current sentence in the discussion section on page 10: “As with any study, there are also limitations, and we acknowledge that while 2-dimensional radiography is clinically
relevant, it does not allow characterization of the 3-dimensional interactions of bones in this complex joint, and further studies using 3-dimensional assessments (incorporating elastic foundation or finite element based modeling [23, 24]) could provide further insight and validation of these preliminary observations.”