

## ANSWERING REVIREERS

Name of Journal: *World Journal of Orthopedics*

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Title: Abnormal ground reaction forces lead to a general decline in gait speed in knee osteoarthritis patients

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Reviewer Comment responses:

Reviewer 1 (**02690875**):

Spelling corrections: Ethical review statement: ethics, principles; Open access statement: License

Word removal: Introduction: line 3, to be ; Results section: line 3: of the

Comment 1: BMI sequence re-arranged as recommended

Comment 2: Added citations for the BMI differences between OA patients and healthy subjects in previous works; also added references for age differences in previous works

Comment 3: Normalisation is the accepted method of presenting ground reaction forces, citation added in the method section with the equation.

Comment 4: In this study, top walking speed was not at which point they had pain and couldn't go any faster, but rather the physical point at which the knee couldn't keep up with the treadmill anymore. However comments have been made to highlight the limitations which could be caused by pain.

Reviewer 2 (**03069318**):

Comment 1: One of the disadvantages of this work is the difference between the two groups regarding age, weight, and leg length the selection of the control group being healthy individuals walking at both top and preferred speed.

Response 1: We agree, but this is an accepted common issue and in accordance with other studies as it is difficult finding patients with no history of knee pathology, furthermore higher BMI is a risk factor for OA. Citations of previous works have been added. Furthermore our analysis was primarily aimed at a matched speed with body weight normalising to address these weaknesses.

Comment 2: It may be useful to also have the same OA patients walking at preferred speed as an internal control

Response 2: We have added knee OA preferred walking speed data as recommended into the table.

Comment 3: Abstract. Please change the order of the BMI for OA and controls.

Response 3: We have changed the order in the abstract for BMI as recommended

Comment 4: Also, the authors should clarify what 18% and 12% mean

Response 4: We have clarified that statement, it was worse for the knee OA patients when compared to the controls

Comment 5: Introduction It would be useful if there is literature support for the fact that asymmetry can lead to falls, injury etc.

Response 5: We have added supporting citations as recommended

Comment 6: Methods Participants It would be useful to evaluate the grade of OA, since evidence suggests that there may be differences between early and late OA

Response 6: Grade of OA is in the results section. These patients certainly had intermediate stage OA as they were awaiting knee replacement

Comment 7: How leg length difference may affect the results? Gait analysis and data collection Well described and supported from previous work.

Response 7: The primary aim was assessing symmetry and loading. Longer leg length can theoretically correlate to larger step length and speed, but these parameters were not the main focus so it does not affect our results or conclusions.

Comment 8 For symmetry ratios it might be useful to provide an estimate for the range of values that would be considered as symmetric/asymmetric.

Response 8: A comment on an estimate based on our data has been given, supported by previous works.

Comment 9: The authors could add a group where the OA patients would be tested at the preferred walking speed.

Response 9: We have added the PWS for knee OA patients as recommended.

Comment 10: The advantages and disadvantages of using this approach could be mentioned at the last paragraph

Response 10: We know from previous work that TWS elicits differences which ordinarily wouldn't be seen. We have made a statement in the first paragraph in the discussion as recommended.

Comment 11: Results For Kellgren/Lawrence grading it would be useful to have the number of patients in each grade (since the mean is 2.5 and most patients had a grade of 2).

Response 11: Statements have been made to conclude that the cohort of knee patients would be best described as intermediate grade.

Comment 12: The results are rather short. Preferably, the authors could be more explanatory in their results (or in the discussion) on what these findings represent and what these results suggest. See also comment below. In table 2, it would be useful to include the data for the preferred walking speed for the OA group. I agree that the comparison to the unaffected extremity can provide valuable information, but the inclusion of these data would be equally useful to make additional comparisons and make useful potential suggestions. For example some of the assumptions for the preferred walking speed could be tested. It would be interesting to see whether the lower push-off force and impulse would persist at preferred walking speed.

Response 12: We have added more globally to the results and discussion section as recommended.

Comment 13: Discussion At the third paragraph of the discussion, the comparison between weight acceptance impulse is made between the OA at TWS and controls at PWS. If someone compares TWS in both populations, weight acceptance is higher in controls. In addition to the discussion made (which is reasonable and well presented) a comment on what this difference may suggest would be useful. In the discussion, there is room for the authors to make suggestions and comment in an attempt to explain some of their findings. For example, the authors found weight acceptance, total impulse, and weight acceptance impulse being statistical significant in table 3. This is slightly different statistically compared to the traditional methods as described in table 2. It would be extremely helpful to have a comment and some thoughts from the authors on the implications of these findings. Overall, the authors could consider being slight more explanatory for some terms and methodology used, taking into consideration that the audience of the journal may not have in depth knowledge about specific terms and methods used in gait analysis.

Response 13: We have added more globally to explain further the findings and their implications.

Comment 14: At the limitations, the authors could add a short description on the implications that age and leg length difference may have in the interpretation of their findings.

Response 14: The subject of interest was not overall walking speed but what factors cause speed to be reduced in patients with knee OA. Statements made to clarify and citations added to backup similar issues.

Comment 15: Conclusions Well-presented. The authors may consider having only the conclusions that were directly withdrawn from the results of this work in this section. Tables Adequate. In table 2, the authors could consider making the statistical significances more obvious. Figures Well-presented

Response 15: Thank you, we have drawn our conclusions based on our findings only.

Reviewer 3 (02586683): good basic research article which can have far reaching clinical implications and needs to be investigated further

Response: Thank you