Author’s response to reviews

Title: Foot and ankle characteristics and dynamic knee valgus in individuals with patellofemoral osteoarthritis

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JFAR-D-18-00142 Response to Reviewers Comments

Foot and ankle characteristics and dynamic knee valgus in individuals with patellofemoral osteoarthritis.

The authors would like to thank the reviewers for their positive and constructive comments on the manuscript. Each point raised in the reviewer reports has been addressed below.

Reviewer #1

This is an excellent and interesting article which is well written overall, with a clear message as the clinical implications and associations of the relationship of the foot and patellofemoral joint osteoarthritis. Below comments related to each section of the paper.

1. Abstract: The abstract is informative and contains the relevant information supporting the main content and findings of the study.

2. Introduction: The introduction section contains useful information and sets the scene to the topic area, highlighting gaps and supporting related evidence. The aim of the paper is clearly stated.

Author response: Thank you for your positive comments on the abstract and introduction.
3. Methods: The methods section contains has the appropriate subheadings, and the inclusion and exclusion criteria for each of the groups are clear. The information on the procedures are easy to follow and are supported by relevant figures for ease of clarity for the reader.

For the frontal plane projection angle measurement and the alignment of the feet, did any of the participants have any issues with this constrained position?

Author Response: Some participants did experience difficulties with the constrained position due to the neutral foot alignment. It is common for those with increased knee valgus to abduct their foot to widen their base of support for balance. We used a standardized testing position to minimize the impact of compensatory strategies on single leg squat performance.

Author Action: The following has been included (lines 165 – 167).

“This standardized testing position was utilized to minimize the impact of compensatory strategies on single-leg squat performance”.

4. Results: The results section was easy to follow and there are no comments.

5. Discussion and conclusion: The discussion has clinical relevance that links well with the SEM. The dynamic implications of these findings will be useful in future studies, but it is useful to see static/quasi static measures being used to record these observations in patients with patellofemoral osteoarthritis.

Author response: Thank you for your positive comments on the results, discussion and conclusion sections.

Reviewer #2

1. Introduction: Page 5, Line 57: please insert 'could' between 'pain share'.

Author Response: amended as requested

2. Introduction: Page 5, Line 64: please could you insert 'the' between 'if FPPA'

Author Response: amended as requested (Line 65)
3. Introduction: Page 5, Line 72: you suggest ‘Our prior work observed that older people with PF pain (i.e. > 40 years) has less midfoot mobility than younger people with PF pain (18-29 years) [7].’ Please change i.e. to people > 40 years. You may wish to consider what, if any, happens to those between 30-40 years? Are there reasons why this age range has not been studied?

Author Response & Action: Thank you for highlighting this oversight. In the study that we reference, the 30-40 year age group was also evaluated. We have clarified this in the manuscript as follows (Lines 73 - 77):

“Our prior work demonstrated that midfoot mobility in people with PF pain gradually decreases between 18-50 years of age, with significant differences observed between those >40 years compared to those between 18-29 years of age [7].”

4. Introduction: Page 6, Line 77: you state that ‘…the role of the foot and ankle in PFOA aetiology and management may be warranted.’ What type of management are you specifically thinking of? Furthermore, if that specific management were investigated further what would be the clinical impact? Could this change how we manage people? It may be worth expanding on this point as this is your ‘so what factor’ for future funding opportunities.

Author Response & Action: Thank you for this suggestion. We have expanded this point in section 4.1 Clinical implications (Lines 299-307):

“The clinical implications of the lower ankle dorsiflexion range observed in the PFOA group warrants clinical consideration based on its potential impact on sagittal plane PF joint loading. However, as the reduction in ankle range may be related to active pain-minimizing compensatory strategies, it is uncertain whether common clinical interventions such as calf stretching and heel lifts would be effective at increasing active sagittal plane ankle range in PFOA. Movement retraining strategies, coupled with treatments aimed at reducing knee pain (e.g. patellar taping) may be more effective in some individuals. The effect of these interventions on PF loads and pain in PFOA needs further investigation”.

5. Introduction: Page 6, Line 79: please consider adding the following ‘The primary aim of this study was to determine if individuals with PFOA demonstrate differences in the FPPA of the knee as well as foot and ankle characteristics, compared to age-matched controls.’

Author Response: This has been amended as requested (Lines 83-85).
6. Methods: Page 6, Line 87: consider adding commas after 'phase II and trial'

Author Response: This has been amended as requested.

7. Page 6, Line 89: 'were' to be replaced with 'was'

Author Response: This has been amended as requested.

8. Static Foot Posture: Page 10, Line 152: please consider the following 'A varus knee angle was defined as a negative deviation from a neutral alignment of 180 degrees whereas a valgus knee angle was defined as a ….'

Author Response: Thank you for this suggestion, we have amended as requested.

9. Page 10, Line 153: you state 'Three out of the five trials were used for analysis.' Do you mean the squats? Maybe consider terminology for clarity to the reader.

Author Response: The word single-leg squat has been included for clarity (Line 180).

10. Page 10, Line 154: 'This was the best three trials, performed … 'It is a difficult sentence to read. Please consider rephrasing or consider the following 'The squats which followed the protocol to obtained the desired movement for example, no loss of balance and correct technique to obtain data points were selected for analysis. If all the squats performed were suitable than the first and last squat were not used for the analysis.' Please could you justify why the first/last squat was removed.

Author Response: Thank you for the suggestions to clarify this information. The first and last of the 5 trials were not necessarily excluded or removed. Rather, in the case of all 5 trials being appropriate, the middle 3 were chosen.

Author Action: We have amended the description as follows (lines 182-185):

“Three out of the five single-leg squat trials were used for analysis. The trials were selected based on overall performance (maintenance of balance, achieving the correct depth of squat and visibility of anatomical markers). If all trials were performed correctly, the average of the middle 3 trials were utilised.”
11. Statistical Analysis: Page 11, Line 177: you state 'Group was entered …'. Do you mean participant groups? Maybe consider rephrasing for clarity to the reader.

Author Response: This has been amended as suggested (Line 204).

12. Page 11, Line 182: 'were' to be replaced with 'was'

Author Response: Because we use the plural term ‘analyses’ (rather than singular ‘analysis’), ‘were’ is an appropriate word here.

13. Results: Page 11, Line 190: you mention 'single-leg squat task, …' is this what you previously mentioned on Page 10, Line 153. Please consider standardising terms for clarity

Author Response: The term ‘single-leg squat’ has been included (now line 217).