Reviewer’s report

Title: Age-related differences in foot mobility in individuals with patellofemoral pain

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Reviewer: Stephen Urry

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Age related differences in foot mobility in individuals with patellofemoral pain

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The authors have produced a good quality report with information that will be useful the relevant professional communities. There are some aspects where small amendments might improve clarity and provide a clearer base for future work.

The following points should be addressed:

Lines 49-51

Range of motion [5], with three-dimensional motion analysis demonstrating that older 50 individuals have less midfoot and forefoot mobility during walking compared to younger 51 people [6, 7]

Ref 6 the participants were age and gender matched? Can the authors truly interpret those findings in this manner?

Ref 7 the age difference between the old and young groups was approximately 50 - is this a fair comparison to the cohort in this study?

Lines 94-95

A single assessor (NJC) used reliable methods to quantify midfoot mobility, which have been 95 detailed previously [11]

This method relies on relaxed sitting versus weight bearing stance but in the manuscript the authors also refer to dynamic gait analysis (kinematics), which is likely to be considerably different (muscle function, for example). Do the authors wish to bring confusion or clarity to the readers? By simply leaving the report as it stands some readers will fail to comprehend the subtle difference between true kinematics and pseudo-dynamics (sometimes confusingly referred to as
"dynamic posture" assessment). Perhaps the authors should include a paragraph in the discussion regarding this issue so that readers comprehend clearly the difference between kinematic motion analysis and measures of dynamic posture (which are not interchangeable)? The alternative is to remove references to dynamic function (kinematics), which I think will be detrimental. Please add a section to the discussion.

Terminology such as "foot mobility measurement" brings considerable ambiguity to the literature because it can be misinterpreted as representative of dynamic analysis. The authors themselves appear to have fallen foul of this problem in Lines 188-189 of the manuscript.

Lines 188-89

Firstly, despite the foot assessment platform being able to evaluate foot mobility, which may (be) useful in predicting dynamic foot function (18)…

Whereas the authors (Franettovitch et al) for ref 18 state:

"The results of this study support the use of arch height and arch height ratio measurements taken statically in the clinical assessment of the foot and may assist the clinician in estimating foot posture during dynamic activity in patients with lower-limb injuries."

It is clear that they estimate "foot posture" during dynamic activity (ie, foot shape NOT foot function).

Again, I would request that the authors insert a paragraph within their discussion to highlight and clarify the crucial difference between dynamic foot posture analysis (pseudo kinematics) and 3D kinematic analysis (true kinematics). If the results cannot be described precisely with the terms DISPLACEMENT, VELOCITY and/or ACCELERATION, then it in not motion analysis.

Lines 160-162

Several studies have shown that ankle dorsiflexion- plantarflexion and subtalar joint inversion-eversion range of motion are 12-30% lower in older individuals [5]

This is unhelpful. Either, re-word it along the lines that "Menz concluded from his review that...", or, itemise and reference the studies of relevance, at least the most supportive ones.

Conclusion

The authors have conducted a sound study and written a good report.
There is one major issue that requires clarification, the confusion regarding foot mobility assessment (essentially not dissimilar to range of motion assessment), dynamic foot posture assessment, and kinematic analysis. The authors can address this easily within their discussion.

In addition there are a few minor points for consideration - I believe these will enhance the report.

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