Reviewer's report

**Title:** Reliability of common orthopaedic tests used to evaluate foot position and foot function in runners

**Version:** 2  **Date:** 17 November 2013

**Reviewer:** Angela Evans

Reviewer's report:

Thank you for the opportunity to review this manuscript.

The main comments I wish to make relate to the background and design of this study, and please be assured that I make these i attempt to be constructive.

To my reading, it is not clear as to why the selected participants were chosen ie whilst acknowledging the influence of lower limb biomechanics in running, injury, performance etc; it was not clear for the purpose of a reliability study - which assesses the repeat accuracy of the tests (not the participants) - as to why these subjects were so purposefully selected and detailed. If there was the expectation that the runners as characterised are known/expected to differ from other same age/gender subjects, then this needs stating and supportive information (in terms of AJ range, ND, 1st MPJ). There are four Tables for participant characteristic data - if there is expected difference in any tested parameters in subjects with differing body fat levels, or who run on particular surfaces - this needs to be stated and clarified, as otherwise the abundance of this information seems superfluous in the context of assessing clinical test reliability.

It was curious to me that the specific clinical tests selected for this study, were, and were used as detailed in the methods. The protocols for both the ND and 1st MPJ appear non-standardised, and differ from better available and published methods (as is immediately acknowledged by the authors when referencing the Sell study as discussion).

The use of clinical tests for both foot and lower limb which involve skin markings have long been shown to be less reliable, yet such methods are used for both 1st MPJ and NDT. Similarly the protocols for both of these tests (1st MPJ and NDT) were ill-defined (no standard step length; sit to stand vs ST palpation; measurement rods). It has also been shown in many previous studies that the reliability of measures which involves manual manipulation of foot posture (ie ND with ST position / sit-stand; 1st MPJ with variable step length) is reduced as opposed to those with standardised and non-manipulated attributes eg AJ rom - which has been well tested previously (eg Munteanu, Evans, Bennell) with the standard weight-bearing lunge method.

Generally, tests involving the height of the navicular (static or dropped) are also normalised against foot length, such that foot morphology is made relevant (ie males often have longer feet than females) (eg Barton, Murley).
The limited intra-rater involvement is curious, why was this data not collected by both examiners (and why only 10 minutes between sessions, more usual to separate sessions by hours rather than minutes). Whilst the inter-rater reliability is of wider interest, the value of the intra-rater data for all examiners is that it helps to identify examiner inconsistencies, between session differences - both/either of which may be particular for any/all of the tests being assessed).

Statistical testing is adequate, but could include be improved with the addition of results/test for each session for each examiner (intra-rater and inter-rater).

Summary points for consideration:

Less focus on participant characteristics, unless justified.

Given the difficulty with navicular palpation, why is this test included?

The testing protocols need to be better managed for both NDT and 1st MPJ, as was the case for AJ rom (and based upon best existing methods eg Sell).

Does AJ rom really need to be re-examined, given the existing results from many studies?

The intra-rater for both examiners should be included.

Thank you for the opportunity to review this manuscript.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests.