**Reviewer’s report**

**Title:** How to squat? Effect of various stance widths, foot placement angles and level of experience on knee, hip and trunk motion and loading

**Version:** 1  **Date:** 14 Nov 2017

**Reviewer:** Gavin Moir

**Reviewer's report:**

Please include all comments for the authors in this box rather than uploading your report as an attachment. Please only upload as attachments annotated versions of manuscripts, graphs, supporting materials or other aspects of your report which cannot be included in a text format.

Please overwrite this text when adding your comments to the authors.

The authors sought to establish the effects of different postures, depth of descent, loads, and experience on the mechanics during the back squat exercise. This research has implications for practitioners interested in improving sporting performance and those concerned with rehabilitation. Overall the manuscript is well designed and well written but I have a number of issues that I would like the authors to address before the manuscript is accepted for publication.

**Specific comments**

Abstract, line 32: You note that '…tissue loading is crucial for positive adaptations and to avoid overload'. However, isn't overload of the tissue caused by loading the tissue and isn't this what the tissue adapts to? I would consider changing the term 'overload'.

Abstract, line 37: Consider replacing the sentence 'The motion was analysed using…" with 'A 3D motion capture system (100 Hz) and two force plates (2000 Hz) were used to record mediolateral knee displacement (ΔD*), range of motion (RoM) at the hip and knee joints, and joint moments at the hip, knee, and lower back.'

Abstract, line 48: Can you really discuss the 'targeted muscle' when you only calculated the net joint moments (which are indeterminate)? Consider changing this sentence.

Abstract, line 49: Change 'stand' to 'stance'. Also, consider changing the term 'overload' in this sentence as the tissue will adapt to the mechanical overload.

Introduction: There are currently 9 paragraphs in this section. Consider combining paragraphs to reduce the number.
Introduction, line 97: I do not agree that the reference you have provided (Müller, 1999) really supports the assertion that the squat exercise has a high risk of injury. I am not aware of any research that would support the assertion that the squat has a high risk of injury. I think that you need to rewrite this sentence to reflect the fact that there are many variations of the squat some of which might result in mechanics that might be considered potentially injurious (i.e. knee abduction etc.)

Introduction, line 117: Change 'Contradictory…' to 'In contrast…'

Introduction, line 145: Change '…knee, hip and trunk joint moments and motion…' to '…hip and knee range of motion and moments…'

Methods, line 151: Remove 'Overall' from the sentence.

Methods, line 209: Change '…knees and hips…' to '…hip and knee joints…'

Methods, lines 231-232: Is there any reason why the two terms on the right of Equations (2) and (3) are presented in a different order? Please be consistent.

Methods, lines 250-251: Change the order from '…KJC, HJC..' to '…HJC, KJC…'

Results, lines 254-255: Consider changing the units to meters, as per the SI system (also for participant heights in lines 159 and 161).

Results, lines 303-304: Change '…sagittal moment in the back…' and '…back moment…' to 'lumbar spine moment'.

Results, line 308: Change '…step width…' to '…stance width…'

Discussion, line 311-313: You need to include references to the measure of spinal curvature and the use of different external loads in the restatement of your purpose.

Discussion, line 316: Change '…moments in the knee, hip and lower back…' to '…moments at the hip, knee, and lower back joints…'

Discussion, line 325: Rewrite the sentence ('…which tend to valgus positions in the knee…' is not grammatically correct).

Discussion, line 352: How could one perform a squat while avoiding knee displacement? Do you mean mediolateral displacement specifically? Please specify.

Discussion, line 355: You did not assess the mechanics of the movement performed by the novice group with any external load added to the barbell. Therefore, I'm not sure that you can make such a statement.
References: The references need to be checked for formatting (e.g. some references have the full title of the source while others have abbreviations).

Table 2: Change 'Introductions' to 'Instructions'

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.
Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.
Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.
Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.
I am able to assess the statistics

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