Reviewer's report

Title: Strength training: kinetic and kinematic differences between Deadlifts and Goodmornings - a biomechanical study of the knee, hip, and back

Version: 1 Date: 9 October 2013

Reviewer: Gerwyn Hughes

Reviewer's report:

Major compulsory revisions

Introduction
1. Overall, I feel you need to provide a much stronger rationale for this study. Justify why you are comparing these two exercises in particular.

Method
2. Lines 126-134: you need to provide more detailed definitions of how joint angles and moments were calculated. I am especially unsure about how L4/L5 moments were calculated as there seems no clear definition. In addition, are you referring to internal or external joint moments? Your definition states that inverse dynamics were used which usually refers to internal moments but your results and discussion section seems to contradict this in the way the results have been interpreted. Either method is appropriate but there needs to be clear definitions provided and consistency throughout the manuscript.

Tables/Figures
3. Revise table format. Firstly, I suggest not including data from other studies here, only present your own data in the tables and then compare your data to previous research in the text. Secondly, avoid too many gridlines, tables should only have three horizontal gridlines and avoid vertically directed text.

Minor essential revisions

Abstract
4. Line 10: this is the first example in the manuscript but this comment applies throughout where you use the term ‘moments in the knee/hip/spine. It is more conventional to use terms such as ‘knee flexion/extension moment’ or ‘moment about the knee in the sagittal plane’. Consider revising throughout.

Introduction
5. Line 48: I believe the word ‘knee’ should be replaced by ‘the’ here.
6. Line 45: you start to describe the DL exercise technique but do not provide full details. I suggest you elaborate to fully describe the lifting technique.
7. Line 67: I feel you need to describe the lifting technique of GM’s somewhere here, similar to as suggested in previous comment related to the DL.

Method
8. Line 113; The information in Table 1 does not seem to relate to the text where it is being referred to. The information in the table seems to refer to ways in which the tasks were standardised but the text relates to determination of joint centres.

9. Line 115; I feel you need to describe the tasks more clearly by giving detailed description of the task and referring to Table 1 for standardisation points somewhere in your descriptions.

10. Line 118-120; here you refer to the definitions for the start and the end of a trial but the information here only relates to GM’s and no description is provided for DL’s.

11. Line 124-125; you have already stated that joint centres were determined through basic motion tasks, suggest removing.

Results and Discussion

12. Generally, when describing the results, please state in the text if results were significantly different or not.

13. Line 178; you use the term ‘isometric exercise of the knee’ but it would be more appropriate to describe what muscles are acting isometrically.

14. Line 191; you use the general term ‘multi-joint muscles’ but the rest of the sentence refers to hip and knee joint. Therefore I suggest referring specifically to the hamstrings here as the rest of the paragraph only seems to relate to that muscle group.

15. Line 192-195; as per previous comment relating to definitions of joint moments, this section in particular is difficult to interpret without a clear understanding whether joint moments refer to internal of external joint moments.

16. Line 232; in your first sentence on Practical implications you state that a large RoM and moment is required. Please back this up with reference to previous literature and you need to be specific about the direction of the moment about the knee.

17. Line 236; when you say ‘to train the hip’ I would suggest it more appropriate to describe the muscles being trained rather than the joint. Since the joint can move in multiple directions and therefore the training effect will be different for different muscles.

18. Line 238-239; when you describe the choice of exercise in relation to whether a subject has a previous injury, surely this would depend on which stage of rehabilitation they were at?

19. Line 242-243; the ranking of strength exercises here has already been stated in the discussion. Consider removing from here.

Tables/Figures

20. Table 2; unsure of what the units are for lumbar and thoracic ROM. Also, there seems to be no need for the definitions of ‘skilled’ and ‘unskilled’ at the bottom of the table.

21. Table 3; no units of measurement are given.
22. Figure 2. Why are you referring to squats in the caption of this Figure? You did not analyse the squat movement so I am unsure what this relates to.

Discretionary revisions
23. Title: I do not feel there is a need to include the term ‘strength training’ at the start of the title. Consider revising.

Abstract
24. Line 9; consider revising the sentence where you say that kinetic and kinematic data were captured using a motion analysis system. I suggest you include that it was a 3D system and that ground reaction force was recorded by a force plate.
25. Line 15; suggest changing the word ‘in’ to ‘of’.
26. Line 16; suggest changing the word ‘in’ to ‘for’.

Introduction
27. Line 33; I suggest rewording the first sentence of the introduction so that you avoid using ‘e.g.’ in the middle of the sentence.
28. Line 41; suggest avoiding using the word ‘astounding’.
29. Line 51; suggest removing the word ‘here’.

Method
30. Line 102; suggest changing the term ‘measurement frequency’ to ‘sampling frequency’.
31. Line 102; I suggest not referring to Figure 1 here but referring to it later in the paragraph since I don’t feel the text here relates clearly to what is shown in Figure 1.

Results and Discussion
32. Line 240-241; this sentence is unclear, consider revising.

Tables/Figures
33. Figures 2, 3 and 4; these figures would be easier to interpret if a key was provided to indicate which lines relate to (rather than simply text in the caption).

Level of interest: An article of limited interest

Quality of written English: Needs some language corrections before being published

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

Declaration of competing interests:
I declare that I have no competing interests