Author's response to reviews

Title: The association between functional movement and overweight and obesity in British primary school children

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Author's response to reviews:

Response to review

The authors would like to thank the reviewers for their time and comments in relation to this manuscript. We have sincerely tried to address all of the comments in full and hope that changes that have been made are satisfactory

Reviewer Number 1

A1. In regard to not always using appropriate/original references, we apologise for this and have now modified the manuscript to ensure that original references have been used throughout and hope the manuscript is now more satisfactory in this respect. In regard to the reviewer’s comments that the introduction does not represent a full coverage of the literature concerning this particular topic, we thank them for highlighting a number of papers and have included these within the manuscript. We have reworked the introduction and discussion accordingly.

We have here tried to identify the difference between studies that examined ‘fundamental movement skills’ and others that examined ‘functional movement’ as although there is overlap between these two concepts there are also important differences and the authors did not want to infer both as being synonymous with each other.

We have also amended the start of the discussion as directed and integrated the other literature within the discussion of the manuscript.

We hope this addresses the reviewers concerns

A2.

We acknowledge the reviewer’s point. We have now explicitly stated in the discussion that the results are confirmatory of that previously reported by Duncan and Stanley.

We have also attempted to more explicitly identify how the present results extend that of Duncan and Stanley (See P11) and hope this is appropriate. In brief, the
use of only a composite FMS score, as is the case of the Duncan and Stanley paper, which the reviewer refers to is limited because it does not identify if the association they highlight stands for all aspects of functional movement or whether there is a pattern to the effect of overweight/obesity on functional movement skills (so whether overweight children perform more poorly on lower body compared to upper body functional movement skills).

We have added Kappa values illustrating test retest agreement for FMS ratings in the present study and hope this is appropriate.

To clarify, the data presented here are all different from those previously reported by Duncan and Stanley (2012)

We have deleted the statement regarding the study presenting new normative values for the childhood population.

A3. We have modified the manuscript and have reworked the statistical analysis to include the Mann-Whitney U and Kruskall Wallis tests for gender and weight status groups respectively. We have also taken on board the reviewer’s comment and have split the weight status groups into NW, OW and OB groups as suggested. We hope the analysis section is now more appropriate.

B1. We thank the reviewer for his/her comment and have sincerely tried to address this in the discussion. The FMS as used in the present study was conceptualised as a movement screen to identify biomechanical deficits that may limit human performance. According to the original work by Cook, this refers to all performance where movement is involved. We have acknowledged that the FMS has been widely used in the athletic domain in prior work but have also illustrated its use with other non-athletic populations. To our knowledge the FMS as used in the present study is the most appropriate screening tool to evaluate functional movement skill in a field setting and we are not sure of which other test batteries the reviewer refers to as the FMS is qualitatively different and assesses a different construct that similar tests that evaluate fundamental movement skill (eg the Test of Gross Motor Development). We have however also stated a need to validate the functional movement screen with performance of everyday activities in a pediatric population as a future research direction. WE hope this addition is satisfactory.

B2. Further to the reviewer’s comments regarding statistical analysis we have split the sample into NW, OW and Ob groups. We have presented the number and percentage of participants in each of these groups in the method section and we hope this addresses the reviewer’s comment.

B3. We have included the criteria for scoring on each test as directed (See P8)

B4. Table added as directed

B5. We have stated in figure legends that no participant obtained a 0 score as directed.
B6. We have moved the explanation as directed and have rephrased the start of the paragraph using the introduction suggested by the author.

B7. We have added references to support the assumptions previously made on P9-10 (now P13)

C1. We have amended the abstract as directed.

C2. We have clarified how the abbreviations for FMS differ and hope this clarifies the use of ‘FMS’ in the current manuscript.

C3. We have identified the ethnic breakdown of all the participants in the methods section

C4. Space added

C5. Repetition of 7 tests deleted as directed

C6. Capital letter changed as highlighted

C7. Added as directed

C8. Changed as directed

C9. Changed as directed

C10. Changed as directed

C11. Changed as directed

Reviewer Number 2

Abstract: Changed as requested

Introduction, last paragraph: deleted ‘Therefore’ as requested

Method (participants): We have provided additional ethnic background of the participants (See end P5). As far as the authors are aware there ethnicity is not particularly a confounding factor for mobility. Data have suggested different patterns of fat deposition across different ethnic groups although the authors do not deem that this would particularly influence the results presented in the present manuscript. We hope this addition is satisfactory.

We have stated the inclusion and exclusion criteria as requested. This included accounting for children who had a range of disorders that may have influenced motor performance. The authors have not stated these and hope this is satisfactory.

Method (data analysis)

MANOVA was not used in the data analysis as data were not normally distributed and so violated the assumption of normality needed for parametrical statistical
techniques. While the authors are more than happy to reanalyse the data using MANOVA, Reviewer 1 has requested the use of Mann Whitney U and Kruskal Wallis tests as mandatory for the revised manuscript. Because of this we have used these techniques over MANOVA. However, should you/the editor deem it more appropriate to use MANOVA we would of course be happy to modify the manuscript further in this respect.

Discussion

First paragraph: Changed as directed

Second paragraph: We thank the reviewer for highlighting this reference. We have included this as directed also look forward to using it in our future work.

Fourth paragraph: We have deleted the Messier study as directed.

Conclusion: Typo corrected as directed

Reviewer Number 3

1) R: We have provided the additional ethnic breakdown of participants as requested.

2) R: We have included further detail regarding the protocol used to assess height and mass as requested and hope this addition is satisfactory.

3) R: the reviewer makes a good point. We have now included further detail as requested (See P7) where we clarify why the total composite score and the individual FMS scores are used for analysis. This procedure is consistent with prior research and we hope the addition is satisfactory.

4) R: We thank the author for the suggestion and have added further detail, including references, to support the conjecture regarding physical activity originally stated on P10, lines 2-6 (now end P10, start P11).

5) R: We have added further detail regarding confounding variables as limitations to the present study (See P13-14) and hope this addition is satisfactory.

6) R: We have proof read the paper and corrected the typos.