Reviewer's report

Title: Reproducibility of tests for lumbar motor control

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Reviewer: Luciana Macedo

Reviewer's report:

I would like to thank the authors for the opportunity to review this well designed and well written paper. I have only a few recommendations.

Major Compulsory Revisions

1. I believe that the authors have erroneously used the term diagnosis or diagnostic assessment. To my understanding diagnosis or diagnostic tests would deal directly with the identification of the nature/cause/tissue source of pain of low back pain. In this study the authors use the term diagnosis as a synonym to a functional assessment to identify deficits in motor control. I think the two are not the same.

2. Also, the authors mention that the tests measure motor control. However, I may disagree with this denomination as motor control relates to a neuromusculoskeletal progress. If the tests are not measuring motor control but position sense and control of the lumbo pelvic stability, the tests should called as such. Additionally, I think it would the study would be strengthened if the authors explain what specifically the tests are measuring and how that would affect the “motor control” of the spine. Overall it would be nice to know why one would choose to use these tests in clinical practice and how what is being assessed on the tests influence low back pain. The last paragraph of the introduction addresses in part this issue but I think this should be clearer.

3. Why did the authors include in the sample assymptomatic patients? What is the clinical applicability of this? I don’t think this is relevant as the test would be commonly applied in patients with low back in which the reproducibility could be completely different due to the levels of pain and disability that the patients may present during testing conditions. I think that if the authors choose to maintain asymptomatic patients in their sample it would be interesting to present the results separetly

Minor Essential Revisions

4. On the third phrase of the abstract the authors state that the reproducibility of LMC tests are unknown. This is not correct as many studies have tested the reliability of other LMC tests not addresses in this study.

5. I think that the authors should consider including in their introduction what type of back pain the study is dealing with. Is it non specific low back pain?
6. Second last line of page 2 (background). “The complex anatomy of the lumbo-pelvic region and the multidimensional…” Shouldn’t it be multidirectional?

7. It seems on the introduction that the authors call LMC a specific/defined group of tests. However, the term lumbar motor control infers not only to the tests evaluated in this study but a number of other tests not addresses in this study. Additionally some of these tests (such as thickness of TrA) have had its reliability tested by many other studies. I think that the introduction would read better if the authors clearly identify the tests of interest before mentioning their reliability in the introduction.

8. The authors mention that the study was a three-phase study. What was the phase three? The authors mention: three phase reproducibility and validity study protocol. What does validity study protocol mean? Are you talking about feasibility?

9. Approximately 50% of patients had LBP. This is not clear to readers. It would be better to present the exact percentage.

10. Discussion 5th paragraph. “The study phase had an almost 50% prevalence of symptomatic subjects, which strengthens the statistical opportunity to demonstrate agreement for a given actual agreement.” This phrase is confusing and needs better explanation.

“Finally, the study was carried out on LBP and non-LBP subjects, for whom the test battery is intended, making the results relevant for screening purpose within this group.” I don’t understand in which case scenario this type of test would be used clinically in asymptomatic patients.

Discretionary Revisions

11. I suggest that the authors change the title of the manuscript to “Inter-rater reliability of tests of lumbar motor control” this way the title would include information on what the study addresses. The same way I suggest changing the word reproducibility that is used throughout the study to reliability.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

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