Reviewer's report

Title: Objective Assessment of shoulder mobility with a new 3D gyroscope. A validation study

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Reviewer: Arturo Vega-Gonzalez

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Title: “Objective Assessment of shoulder mobility with a new 3D gyroscope – a validation study ”

The paper presents an alternative to the assessment of shoulder mobility, which is light and portable. This measurement is compared to the BIODEX to validate the new method. Assessing shoulder mobility is an important issue in clinical examination. Comments regarding this paper are as follow:

Major Compulsory Revisions

1) Authors calculate a linear regression model to assess reliability and validity of the measurements, however this is a misconceived analysis. A high correlation value does not mean a good agreement or repeatability. Validation of a measurement is usually performed by comparing the measurements of one method with the measurements of an established technique. There is now general agreement that the interclass correlation coefficient (ICC) and the test suggested by Bland and Altman should be used to compare different measurement systems. It is advisable to reanalyze the data with such methods. The following references could guide the authors.


A figure showing an equality plot or Bland- Altman plot would be welcome to have a better picture of the validity. These methods can also be used to establish the repeatability.

2) Authors report underestimation for small ROM and overestimation for large ROM. This, together with the wider prediction intervals as the angle increase, suggest the data are skewed and possibly have a non-normal distribution. Did the authors verify this requirement prior to apply a parametric test such as the linear regression model?
Minor Essential Revisions:

Format of tables must be standard (legend at top).

All “P” indicating a P-value must be in capitals.

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

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

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