Reviewer's report

Title: Decreased levels of physical activity in adolescents with Down syndrome are related with low bone mineral density: a cross-sectional study

Version: 2 Date: 8 May 2013

Reviewer: Carol Garrison

Reviewer's report:

Major Compulsory Revisions:
1) As discussed previously, the authors do not provide information indicating how well study participants adhered to the research protocol. Presently, the lowest tertile indicates physical activity of 11 hours, 52 minutes per day, and the medium physical activity tertile indicates total minutes of daily physical activity between 11 hours, 52 minutes and 13 hours, 15 minutes. This does not seem to represent normal activity for adolescents.

Did the authors determine how much time was spent in activity without the accelerometer present (ie - in the excluded activities such as bathing, showering, swimming, and playing contact sports)? Without some system to assess how much time was spent in such activities, the information regarding total daily physical activity time is incomplete. With the small numbers in this study, this calls into question the results regarding the relationship between BMD z-score and total physical activity tertile in children with Down Syndrome.

For example, a daily log indicating the time the individual showered/bathed, was involved in swimming/contact sports, slept, and the times the accelerometer was placed on or removed - would augment and complete the data being examined.

If such data is not available, then perhaps this could be addressed in the discussion.

Minor Essential Revisions:
1. Appreciate the attention to previous suggestions.
2. I apologize for getting the units wrong on the BMD measure.
3. Appreciate the rewording of the tertile groups using "low", "medium" and "high". Recommend reviewing the manuscript to assure the changes were made consistently throughout - including labels of the figures.
4. Just as you used the Z-score for the BMD, recommend using age and gender adjusted Z-score or % for the BMI, height and weight for comparison purposes.

Discretionary Revisions
1. I would appreciate more discussion regarding the "valid time". Does valid time equal the total minutes of daily PA? An explanation as to why the 20 minutes of zero periods is deleted would be interesting.
2. The BMD Z-score is often referred to simply as the "Z-score". I would suggest using "BMD Z-score"

3. I do not believe that the abbreviation "VPA" is noted the first time that vigorous physical activity is used (in the abstract).

**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, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests.