Reviewer’s report

Title: Reliability of upright posture measurements in primary school children

Version: 4 Date: 21 March 2005

Reviewer: Elmer Villanueva

Reviewer’s report:

General

The article described the findings arising from a project designed to estimate the reliability of measurements of posture in school children. The Authors appear to have the necessary content expertise and have published previously in the area.

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

There are two major points requiring either clarification or discussion.

First, the Authors must describe the impact of the sampling design on the external validity of the results. Convenience sampling is acknowledged as a key method of deriving a study population in certain areas of research. However, it's appropriateness in this setting certainly imposes specific limits on what can be taken away be readers to apply to their particular circumstances. Foremost is the question -- to whom do the results apply? This is not easy to answer in some applications of the random sampling method and is certainly difficult when convenience samples are collected.

Second, the Authors need to be extremely careful about adopting a declarative posture (forgive the pun!) in the presence of null findings that support their work, especially if these arise in the context of small sample sizes. The statistical techniques used by the Authors struggle in the presence of small samples (ANOVA ICC calculations on n=8 to 12 samples with two or more independent variables and with post-hoc adjustment of results). The wide confidence intervals are a function of both small samples and inherent variability. If the Authors choose to hold up their findings as indicative of “acceptable” reliability, one can argue that the study was set up (poised, if you will) to deliver just that conclusion because of its limited numbers.

Post-hoc power calculations are no protection against this. There is generally no call for these calculations as they provide very limited information -- much less so than that of the confidence interval. In fact, post-hoc power calculations essentially sidestep the more important question: what is the clinically important effect size we wish to detect? By substituting the values found in the study, the Authors take clinical considerations out of the equation. Is there an acceptable alternative? Yes. The calculations may be used to adjust their a priori sample size estimates.

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

The Authors must report standard deviations, instead of standard errors. Confidence limits refer to the "ends" of a confidence interval. In this paper, the Authors are reporting confidence intervals, not limits (i.e., xxx TO yyy). This needs to be changed accordingly.
Age groups must be reported in full in Figure 3. The present legend is uninformative.

Discretionary Revisions (which the author can choose to ignore)

For further information on post-hoc power calculations, I would suggest the following references:

Smith AH, Bates MN. Confidence limit analyses should replace power calculations in the interpretation of epidemiologic studies. Epidemiology 1992: 3(5); 449-52.
Goodman S. The use of predicted confidence intervals when planning experiments and the misuse of power when interpreting results. Annals of Internal Medicine 1994: 121(3); 200-206.
Post hoc power analysis--another view. J. Fogel. Pharmacotherapy 2001: 21(9); 1150.
Levine M, Ensom MH. Post hoc power analysis: an idea whose time has passed? Pharmacotherapy 2001: 21(4); 405-409.

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

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

Quality of written English: Acceptable

Statistical review: Yes

Declaration of competing interests:

I declare that I have no competing interests