Reviewer’s report

Title: "The influence of gender and body mass index on the FPI-6 evaluated foot posture of 10- to 14-year-old school children in São Paulo, Brazil: A cross-sectional study

Version: 0 Date: 26 Aug 2016

Reviewer: Peter Guy

Reviewer's report:

Dear Barbarah Goncalves de Carvalho and your research group members

I commend your research group for organizing and executing this cross sectional study of 1394 adolescent subjects.

I have separated my comments based on each section of the paper. The abstract section and title will be commented on last.

Introduction

Your group has clearly outlined a structured argument of why this study is needed based on the results or conclusions from the 18 articles cited. The aims of your research and the hypothesis are clearly outlined.

My understanding is your study is important because the FPI data in the 10 to 14 age group should be separately analyzed instead of being lumped together in the 10-19 age group as per a previous study. Henceforth, your study results may allow for normative data to be used in possible physical therapy strategies.

By the end of the introduction section you know the reason and the benefits of your study.

Methods

I reviewed your Fluxogram- Figure 1.

I have a number of questions concerning the subject numbers from the start of the study to the final number of subjects actually evaluated.

You started with 2711 males and 2591 females. You had non adherence of 2740 subjects leaving 2562 subjects. Furthermore, if you account for the 57 subjects in the box to the right of the
fluxogram (school cut, parents did not authorize, gave up participation, foot deformity, Leg length) This leaves (2562 -57) 2505 subjects.

The addition of the proportion of males to females remaining after non adherence in Figure 1 will allow for a better understanding of gender proportion.

Furthermore, let's assume the proportion is 50/50 male to female (1252 males and 1253 females). How did you arrive at such a disproportion between the 473 male and 921 female subjects evaluated? What was the protocol to result in these subject numbers? Did you use simple random, systematic, stratified, multi stage cluster or time based selection criterion from the remaining 2505 subjects after nonadherence? In my opinion, this disproportion needs to be addressed in Figure 1 or in the methods section.

Can you include a picture of a subject positioned on your apparatus?

Everything else in the methods section is well explained with respect to the reliability of the FPI measures and all the statistical tests used.

However, my forte is not statistical analysis which is why I asked a colleague to comment on your statistical analysis, the following are his comments:

"If I understand correctly, the investigators collected FPI-6 scores, for the right and left feet for 473 males and 921 females. In addition, they collected information regarding age (10 year, 11 year, 12 year, 13 year and 14 year) and body mass index (BMI) used to classify subjects as (underweight, normal, overweight and obese).

The investigators reported the use of the independent t-test to investigate the male and female differences and the use of ANOVA to investigate difference with regards to age and BMI. It is not clear, whether the authors fitted a single model or different models to test for age and BMI.

1. I would like to know why the authors used separate models to address their questions instead of using a single model. A single ANOVA model would have been sufficient to address the questions. The model would use FPI-6 score as response; feet (Left or right), gender (male, female), age (10, 11, 12, 13, and 14 years) and BMI (underweight, normal, overweight and obese) together with the important interactions (feet, gender), (feet, age), (feet, BMI), (feet, gender, age) and (feet, gender, BMI) as factors in the model; and subject as a repeated measurement factor.
2. There is no mention in the paper regarding the need for adjustment of the p-value due to the multiple comparisons reported in the paper. There are 10 reported p-values and each test was assumed to be significant if the p-value < 0.05. To control for the probability of type I (reported a test as significant when it is not), only p-value < 0.005 would be considered significant based on a Bonferroni correction. Only one p-value in the paper was < 0.005 (FPI-6 differences in the Right foot for different BMI values).”

Results

My statistics colleague noticed that the label for Table 4 is incorrect. He thinks, this should read Table 4. FPI-6 comparison between the different BMI values (in adolescents with different age groups). Wording in brackets should be removed.

I don't see a table for the subject anthropometric characteristics? I think information in table format would be useful for the reader.

Otherwise, the results of your study are clearly listed based on your protocol in the methods section.

Discussion

You have compared your results to previous studies both comparable and contrary to the FPI findings in the age group you focused on studying. You have also provided an adaptive postural mechanism explanation for the FPI and BMI results. You have acknowledged the discrepancy in the sample size for gender and BMI classifications and the need for longitudinal studies. You addressed that the hypothesis is partially confirmed. Your conclusions are appropriately based on your results.

Abstract

The abstract is clear about the aims, methods, results, conclusions and implications. The research question is clearly stated

The title is clear and a concise statement of the methodology of your study. I wonder if FPI could integrated into your title.

I have suggested an alternative title.

"The influence of gender and BMI on FPI evaluated foot posture of 11 to 14-year-old school children of Sao Paulo, Brazil: A Cross-sectional study".
I hope you find my comments helpful. I enjoyed reading your study.

Good luck with your future research projects

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