Reviewer's report

Title: Physical activity, Cardiorespiratory fitness, and the Metabolic syndrome in Adolescents: A Cross-Sectional Study

Version: 1 Date: 31 March 2011

Reviewer: Carla Moreira

Reviewer's report:

Discretionary Revisions
The authors may consider to use the word “sex” instead of ”gender”.

The authors may consider being consistent in the use of the terminology when referring to cardiorespiratory fitness: “aerobic fitness”, “V02máx”, “physical fitness”. Similar comment about the use of “subjects” and “participants”.
Please choose one and be consistent throughout the manuscript.

The authors may consider removing the word “the” before Metabolic Syndrome along the manuscript.

Minor Essential Revisions
Abstract, Background:
A word is missing between “known” and “adolescents”.

Abstract, Methods:
Eliminate “VO2máx” and write “cardiorespiratory fitness”.

Background:
First paragraph: need to add a sentence to clarify the definition of metabolic syndrome in children and adolescents.

Third paragraph “…about MetS in youths.” suggests “…about MetS in youth.”

Fifth paragraph “...to analise” suggest “to analyze”

Methods, Sample
First paragraph: the authors say that “schools were randomized according to type (age range and gender), location (urban, suburban, and rural), and the socioeconomic characteristics.” I would like to be informed about the socioeconomic characteristics.

Measurements
The measurements should be rewritten for a more logical structure and an easier understanding. The variables are mixed and the information it is not clear.

Fourth paragraph: both stadiometer and balance must have the brand and
manufacturer information.

Measurements, Physical Activity
First paragraph: need to add a sentence to better explain the questionnaire used to estimate physical activity (i.e., that classifies physical activity in terms of energy expenditure).

The authors say that “…physical activity scale of 1-9 (1 being sedentary active, and 9 being very active).” Please, clarify.

“(MVPA) expressed in minutes for day” suggests “(MVPA) expressed in minutes per day.

Fifth paragraph: information about cardiorespiratory fitness test is lacking. Although the name of the test is mentioned, more information about the protocol and the measurement must be included.

Measurements, Blood Samples
Third paragraph: rewrite both sentences: ”All the measurements…. same sequence” and “The data used …. scholl site.”

Measurements, MetS definitions
“…waist cincunference # 90th..” suggests “…waist circumference # 90th percentile..”
“…SBP or DBP> 90th ..” suggests “SBP or DBP> 90th percentile..”

Statistical procedures
First paragraph: rewrite the sentence ”Indepentent … the genders groups.”

The physical activity tertiles were present and the cardiorespiratory fitness tertiles should be presented as well for a more logical structure.

Results
First paragraph: “Table 1 presents….evaluated in both genders by sex.” suggests: “Descriptive characteristics of the data by sex are shown in Table 1”

Third paragraph: “…MetS was observed in the sedentary adolescents and with low fitness levels” suggests “…MetS was observed in the sedentary adolescents and in those with low cardiorespiratory fitness”

Fourth paragraph: eliminate the sentence “The prevalence of MetS increased significantly with reduction in physical activity and cardiorespiratory fitness levels”. The idea has already been mentioned in the preceding sentence.

Fifth paragraph: the authors say that “Significantly higher ratios (p<0.05) were found for high and low VO2máx.” Please, clarify.

Discussion
Fourth paragraph “…with higher physical activity levels and higher VO2máx had
less MetS.” suggests “with both higher physical activity and cardiorespiratory fitness levels had lower prevalence of MetS”.

Eighth paragraph: discussion of the physiological process of the muscle fiber metabolism is not necessary that is out of the focus of this paper.

Table 1
Remove “.. values are the mean (SD)” from the title and write down the table.
“1th, 2th and 3th tertile” suggests “1st, 2nd and 3rd tertile”
Eliminate ,000 and write <0.001.

Major Compulsory Revisions

Measurements, Resting Blood Pressure
Third paragraph: when the blood pressure was taken? How many measurements of the blood pressure were taken? How did the authors get the SBP and DBP values presented in Table 1? There should be more details about the measurement of resting blood pressure.

Measurements, MetS definitions
The authors say that “Abdominal obesity was considered as waist circumference # 90th for age and gender19.” However, accordingly to the reference the waist circumference percentile was defined for children and adolescents aged 5-17. The sample of this study encompasses children and adolescents between 10-18 years old. Please, clarify.

The authors say that “Hypertension was considered as having an average SBP or DBP> 90th by age and gender based on published reference data15.” Accordingly with the reference mentioned “Hypertension in children and adolescents continues to be defined as systolic BP (SBP) and/or diastolic BP (DBP), that is, on repeated measurement, >95th percentile” Please, clarify.

The determination of hypertension implies that this variable should be adjusted for age, sex and height. In the manuscript the authors only state that adjustments were made for age and gender “…average SBP or DBP> 90th by age and gender”. Please, clarify.

Results
Statistics are poorly presented.
First paragraph: the authors say that “Apart from height, weight, VO2máx, SBP, and glucose, which were higher for the males, no other parameters differed by genders”. What about waist circumference and MVPA? In the table 1 these variables showed significant differences between sexes. Please, clarify.

Second paragraph: the authors say that “the prevalence of MetS was more common in males than females”. Was this a significant difference?

Second paragraph: it will be important to add more information about the
individual risk factors. What was the most prevalent? I will suggest adding a table with this information.

Third paragraph: after “...increased prevalence of MetS was observed in the sedentary adolescents and with low fitness levels” the numeric results and p value should be included.

Fourth paragraph: the same comment for the sentence “The males showed higher prevalences of MetS than females in all levels of physical activity and fitness.”

Fifth paragraph: the authors should add numeric results in parenthesis (OR, CI) at the end of the sentence “significantly ....VO2max”.

The authors divided the physical activity into tertiles, however, the logistic regression showed only 2 categories. Please, clarify.

Discussion
The discussion must be reorganized in order to achieve a clear exposure of the main findings.

Third paragraph: the authors say “there are not others studies pertaining to the prevalence of the MetS in Brazilian children and adolescents with which to compare”. I suggest the authors to search more carefully in PubMed, because there are some manuscripts regarding this issue.

The authors may consider discussing the work of Jonathan Ruiz and Filipe Lobelo although it is not possible to make direct comparisons because they used accelerometers however, they published this research area.

It is imperative to introduce one or more references in the end of the paragraph “Future intervention...an unhealthy condition”.

Level of interest: An article of limited interest

Quality of written English: Not suitable for publication unless extensively edited

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.