Reviewer’s report

Title: Relationship of body mass index to percent body fat and waist circumference among schoolchildren in Japan - the influence of gender and obesity: a population-based cross-sectional study

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Reviewer: Magda Antal

Reviewer’s report:

Reviewer’s comments on the manuscript by Hirotaka Ochiai et al. entitled „Relationship of body mass index to percent body fat and waist circumference among schoolchildren in Japan – the influence of gender and obesity: a population-based cross-sectional study”

The authors investigated the relationship among body mass index (BMI), percent body fat (% BF) and waist circumference (WC) in a population of Japanese schoolchildren and examined the influence of gender and obesity on these relationships.

They conclude that the correlations among the parameters studied could be influenced by obesity as well as by gender, and it is essential to consider gender and obesity when using BMI as a surrogate marker for % BF and WC for epidemiological use.

Minor Essential Revisions:

1) Ad “Information collection”. It would be suitable to present the variation coefficients in the case of height and WC with the repeated measurements.

2) The authors defined obesity on the basis of references 18 and 19. My questions: What is the difference between the two definitions? The obese category did also involve the overweight students or not? What cut-off values were used for %BF by the authors? These issues should be explained in the text.

3) The small, but statistically still significant differences between fourth grader girls and boys (Table 1) in weight and BMI can by all means primarily attributed to the large sample size. In addition to this, do the authors mean that this difference has any physiological importance or not? They are expected to take a stand in this.

4) Ad Influence of obesity (page 11). The “weaker correlation” observed between %BF and BMI in obese students needs other explanation than the small sample size of obese persons which is too general, since in the case of girls the correlation was 0.7 (line 4) even with a small sample size.

5) Ad Table 1. SD or SEM values should be indicated. I would recommend that the authors also present the percent of obese students in each group in addition to the absolute numbers.

In summary, It appears that the authors in their manuscript provided useful data
in conformity with their objective. On the other hand, the authors should emphasize more explicitly that the BMI does not give relevant information with regard to obesity, i.e. body fat mass. Thus, on the basis of % BF, in the overweight group there can be many obese persons with identical BMI depending if they are muscular or obese.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**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'