Reviewer's report

Title: Waist circumference vs. body mass index in association with cardiorespiratory fitness in healthy men and women: a cross sectional analysis of 403 subjects

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Reviewer: yoram epstein

Reviewer's report:

This is an observational study, in which Sherf and colleagues examined waist circumference as an additional measure of adiposity when evaluating cardiorespiratory fitness in general checkups setting in healthy men and women. This manuscript emphasize two important aspects: waist circumference is a valid and important measure of adiposity, which should be measured in the clinic in addition to the BMI; there are major gender differences in the relationship between physical fitness and adiposity. These gender differences may infer the need for a different approach when measuring adiposity in men or in women and perhaps a sex-specific interpretation to clinical findings regarding fitness and obesity.

Major comments

1. The authors acknowledge that the cross sectional nature of their data are a weakness, and reverse causality between obesity and physical fitness cannot be excluded: people with poor physical fitness may gain weight and become more obese or with higher waist circumference. This should better be explained.

2. The authors chose to compare the two most readily available and easy to measure obesity index: BMI and waist circumference. It would be interesting to know which of these two is more closely associated with the gold standard measurement for adiposity, although this is not the objective of this study. In that respect, VO2 was chosen as a gold standard or a measure of total well being.

3. The authors report that smoking was positively correlated with better physical fitness, a finding that is repeatedly observed but should better be explained; in fact the authors did not provide any explanation. The definition of smoking in this study is unclear to me. If smoking means current smoking, then reverse causality may also apply here: it may be that past smokers quit smoking due to poorer health profile and may show poorer physical fitness, thus current smokers are a selected subsample of the more healthy and resilient subjects.

Minor comments

General comment: The division into paragraphs is not very clear. Either put an extra line space or indent.

1. Page 3. Line 3 and line 13 – please add US before National Health and Nutrition Examination Survey, so to better understand that this is a USA survey
and not an Israeli survey.

2. Page 3, line 5 – please open brackets before the word calculated.

3. Page 3, line 6-7 – BMI may be a misleading index in some populations; e.g. if fat mass is low and lean body mass (muscle mass) is high. Please add a note about that.

4. Page 3, line 8-11 – I suggest to change the order of the sentences and to start with the second sentence (starting with the word since). Then, continue with: Thus, measurements… Line 4 should start a new paragraph.

5. Page 4, line 2 – should be systematic review (instead of systemic review).

6. Page 4, line 19-20 – first, the word "was' is missing before "more". Second, I am not sure the sentence is in place in the context of the paragraph.

7. Page 8, line 11 – should be "waist circumference" instead of BMI (?).

8. Page 9, Discussion, line 3 – please add "Statistically" significantly stronger.

9. Page 13, Conclusions, line 4 – please erase "the opposite relationship was observed". Your findings do not support your conclusion that in women BMI correlated stronger than waist circumference with physical fitness. Please add "somewhat" to your claim that: "BMI correlation more stronger …".

10. Figure 1-b – please replace WC with the full term (waist circumference)

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

The reviewer declare no conflict of interest regarding this publication