Reviewer's report

Title: Lower youth steps/day values observed at both high and low population density areas: a cross-sectional study in metropolitan Tokyo

Version: 0 Date: 04 Jun 2018

Reviewer: Jeffrey Graham

Reviewer's report:

This is an original study investigating step counts (daily, in-school and out-of-school) across gender and age (6-15 years) by population density from the Tokyo Metropolitan Survey of Physical Fitness, Physical Activity and Lifestyle. Findings generally revealed a U-shaped distribution across population densities with the lowest and highest subgroups having lower daily and out-of-school step counts. However, in-school step count did not differ by population density, gender or age.

Overall, the paper is well written. The introduction, methods, analysis and discussion are all sound for the most part. As such, I would recommend this paper for publication pending minor revisions (or comments) I've outlined below for the authors' consideration.

MAIN COMMENTS

Although the authors have done a great job summarizing the pattern of results with regards to their study objectives, I found that the discussion could be elaborated on with regards to what their findings mean for health outcomes. For instance,

1) Are children and youth attaining enough steps to be considered healthy or meeting physical activity guidelines across all population densities, ages, and genders?

2) The differences between subgroups range from a couple hundred steps to about 1000 steps. For some groups, these differences are statistically significant but are they clinically relevant? Specifically, based on total counts are these differences important for health outcomes.

3) Lines 224-242 - I appreciate the plausible interpretations for different population densities, step counts, and environmental factors given that the data from the present study do not provide information on neighbourhood environments. However, could the
authors speculate what might be different (environmental or not) among the lower population density subgroup that attributed to the highest daily step count?

SPECIFIC COMMENTS

Introduction

4) Pertaining to point #1 above, the introduction would be a good place to discuss recommended daily step count values for different ages and genders (see Tudor-Locke et al., 2011).


5) The introduction generally covers step counts by population density across different countries. However, I think it is important to introduce findings with regards to differences in age and gender as these are important variables in the present study. For instance, I am not sure that the sentence on lines 119-120 is enough to justify looking at age and gender, "As trends of in-school, out-of-school, and total daily step counts were expected to differ by gender and school grade, appropriate subgroup analyses were conducted". Please specify how they were expected to differ to provide support for the subgroup analyses.

Methods

6) Lines 111-113 - How many participants were included with only one day of valid data? Was the pattern of results similar for participants who had 7-valid days versus one?

Results

7) Lines 161-162 - The authors discuss how the findings for daily step count displayed an inverted-U shaped distribution. I think it might be worthwhile to create a figure (i.e., bar graph) that shows the total daily step counts by density subgroup that includes two bars per subgroup (one for male and one for female) and refer to it here. Although the U-shaped pattern of results can generally be seen in Figure 2, it may be more impactful to
present the bar graph I suggest above which would clearly show the U-shaped distribution alongside the actual total step counts. The counts in the current Figures only compare to the reference group and Table 3 is a lot to take in at once. In addition, there are several instances within the results section where the authors discuss "also showed a U-shaped distribution". A visual representation of the total count would strengthen the U-shaped distribution findings and ease in the interpretation of the results for readers. However, I will leave this to the authors discretion whether a Figure is added.

8) Figures - Sorry if I missed it, but it is unclear what the *'s in the Figures represent. I assume statistically different (p < .05) from the reference group? This could be discussed in the statistical analysis section. In addition, to a note in the Figures.

9) Similar to the above - Please provide justification for comparing subgroups to the reference group. How was the reference group chosen? Why wasn't the highest step count group considered the reference group?

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Unable to assess

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics
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Acceptable

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