Reviewer’s report

Title: Trends in childhood obesity and central adiposity between 1998-2000 and 2010-2012 according to household income and urbanity in Korea

Version: 2 Date: 30 July 2015

Reviewer: Malavika Subramanyam

Reviewer’s report:

Major Compulsory Revisions

1. Abstract, methods: Please mention that the trends were gender-specific.

2. Abstract, methods: Please add information about source of data in the abstract. It was only when I reached the methods section of the article that I found out that this study used two repeated cross-sectional surveys.

3. Abstract, results: Please include direction of difference (urban>rural?) when mentioning the prevalence gaps in childhood obesity between urban and rural areas.

4. Abstract, conclusions: These need to be more specific to the findings of this study. Also, I didn’t understand what kind of “gaps in childhood overweight and obesity” the conclusions were referring to. The conclusions are stated in very general terms and so it is difficult to understand what the conclusions are and how they fit with what was found.

5. Background: “Prior studies have shown that individuals with higher SEP showed stabilized or declining trends in childhood obesity, while those with lower SEP showed increasing trends.” Please add a mention of where (which countries) these prior studies are from.

6. Background: “Major cities showed stabilized or decreased childhood overweight prevalence over recent decades, whereas other areas showed increasing prevalence.” Please mention which countries these “major cities” are located in. Or you could say “Globally, major cities such as X and Y.” Also, it is unclear what you mean by “other” areas. Do you mean rural areas? Please be specific.

7. Background: “It is unclear whether time trends in childhood overweight and obesity and central adiposity differ according to SEP and urbanity.” Have no previous studies examined this question in the South Korean context? If so, please state that explicitly.

8. Background: “….using repeated cross-sectional nationally representative samples…” Please mention how many samples were included.
9. Methods: The section describing the operationalization of household income and urbanity needs more detail. Is this annual or monthly income? Was the information obtained in response to a single question in the survey? If not what were the questions used? How were answers to multiple questions combined to produce a single income variable? How reliable is the income data? What was the definition used to classify an area as urban or not? At the minimum a reference to the administrative definition of urbanity should be included.

10. Methods: Please add a note justifying the use of multiple criteria for defining overweight and obesity.

11. Results: In general, recommend organizing the results section using sub-headings. Perhaps the first sub-section can present results on general trends in BMI, WC, overweight and obesity and the second sub-section can present results related to the relationship between income and urbanity with the outcome variables.

12. Results: There are a few sentences along the lines of “Analyses of household income also produced similar patterns, in which disparities according to urbanity develop in opposite directions according to gender, but there was no statistically significant interaction between SEP and time period (Table 3).” This was confusing to me. I think it would make more sense to substitute “household income” for “urbanity.” Or re-word it in this manner “Analyses of household income also produced results similar to those of urbanity—disparities according to household income develop in opposite directions according to gender, but there was no statistically significant interaction between income and time period (Table 3).”

13. Results: “...but a significantly expanding disparity of childhood obesity among girls according to WHO criteria was observed.” Unclear what kind of disparity this phrase refers to.

14. Discussion: “Moreover, the impact of the early childhood socioeconomic environment on later obesity and associated etiologically relevant periods may differ by gender [26, 27].” Please a sentence here describing the impact differing by gender, i.e what the two patterns are.

15. Discussion: “Overall time trends of overweight and obesity prevalence between 1998-2001 and 2010-2012 among girls showed a plateaued pattern in this study. Moreover, time trends in childhood overweight and obesity prevalence between 1998-2001 and 2010-2012 according to SEP and urbanity showed no significant trends among girls. However, among boys, overall time trends of obesity prevalence between 1998-2001 and 2010-2012 showed a stabilized pattern, but the overall time trends of overweight prevalence were increasing. Based on the IOTF criteria, boys with high household income and urban residency showed increasing time trends in obesity and overweight prevalence between 1998-2001 and 2010-2012. In addition, statistically significant interactions of obesity prevalence between urbanity and time period were
detected among boys, indicating significantly widening gaps in the prevalence of childhood obesity according to urbanity between 1998-2001 and 2010-2012. Among girls, statistically non-significant obesity prevalence gaps by urbanity were observed, but the directionality of the gap was the opposite (obesity prevalence in rural areas was higher than in urban areas). The results regarding gender differences in diverging urban/rural patterns for childhood overweight were similar, albeit statistically non-significant.” This entire portion belongs in the results section and not in the discussion section. Please delete all of this and please add more text to the discussion that interprets the results and situates them in context.

16. Discussion: “Prior studies demonstrating increasing socioeconomic inequalities in childhood obesity and overweight have indicated that the prevalence of childhood obesity among high SEP groups has stabilized or decreased whereas low SEP groups have shown increasing trends.” Please mention the geographic areas where these prior studies were conducted.

17. Discussion: “Prior studies demonstrating increasing socioeconomic inequalities in childhood obesity and overweight have indicated that the prevalence of childhood obesity among high SEP groups has stabilized or decreased whereas low SEP groups have shown increasing trends [28, 4, 29]. Other studies have shown that overweight prevalence in major cities have stabilized or decreased whereas the prevalence of overweight has increased in other areas [6, 7].” These sentences are almost identical to the ones in the introduction section. They need to be re-phrased. And the geographic areas they refer to need to be explicitly mentioned.

18. Discussion: “…gender differences in body perception and early childhood factors.” Need more information about this. What are these gender differences? What is the directionality of the differences? What might be the reasons for these differences? How do they fit the Korean cultural context?

Minor Essential Revisions

1. Keywords: Recommending adding the word “trends” to the list of keywords.

2. Methods, study subjects: “A total of 6016 participants.” Please insert the phrase “Data from” at the beginning of this sentence.

3. Results: “Subjects living in rural areas decreased by about 11 percentage points.” Please add the phrase “Proportion of” at the beginning of this sentence.

4. Results: “Figure 1 presents changes in the distribution of BMI Z-scores among boys and girls in 1998-2001 and 2000-2012 according to household income status (high vs. low) and urbanity. In 2000-2012, a large part of the BMI Z-score distributions were positive among boys regardless…” Should it be “2010-2012” and not “2000-2012”?

**Level of interest:** An article of importance in its field
Quality of written English: Needs some language corrections before being published

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.