Reviewer's report

Title: The role of cognitive stimulation at home in low-income preschoolers' nutrition, physical activity and Body Mass Index

Version: 1 Date: 23 Feb 2017

Reviewer: Pattanee Winichagoon

Reviewer's report:

This MS is a secondary analysis using available variables from a national survey. The authors have clarified comments made by previous reviewers. However, there are several issues which need further improvement.

1. Abstract
   a. It is uncertain if the conclusion is correct, since there are some unclear data interpretation (see more comments below).

2. Introduction
   a. Since a few cited literatures already showed the link between home stimulation and BMI/overweight/obesity, please clarify why this study addressed the same question.

3. Methods
   a. Do data used in the present study are baseline (2006) and Spring 2008, Spring 2009?

   b. Page 5, about lines 33-35: It is stated that 'sample size after applying appropriate sampling weights…'. This is not adequate to inform how the sample size was calculated.

   c. Although the authors indicated that details about the assessment can be found in Strauss & Knight, 1999, it is still useful to have a brief notes on some aspects (see some comments below).
d. Table 1: normal birthweight was defined as >5.5 lbs, which means that very high birthweight (macrosomia) may in fact be included. Please clarify if there are any macrosomia.

e. Cognitive stimulation: Table 2 - Please clarify what the composite scores are.

i. From the explanation, there are 22 items tested. Are the composite scores the summation of these 22 items?

ii. What are the mean/SD values of individual items calculated? Are they means/SDs of the 1905 children, and what is the meaning to present these means/SDs? Are these useful for interpretation of results?

f. Junk food consumption: is there any evidence that higher junk food consumption is a good proxy or valid as reflecting the range of eating habits (poor to good)? Since more than one food items are in each of the food groups used, please clarify how the question was asked, and if it is likely overestimating the reported intakes (e.g., reporting several items within a group, how was the score considered?).

g. It should be pointed out in the Method section that only data of junk food consumption were used for the analysis, due to data availability.

h. BMI-Z-score & categorization: Healthy weight is defined as those having BMI <85th percentile. This means this category is in fact inclusive of those who had BMI-Z in the underweight or less range, or is it in fact those having low BM-Z were excluded? Please clarify and discuss if this may have affected the interpretation.

4. Results

a. Table 4 & 5:

i. The risk ratio and 95%CI can also be presented in the same column, and suggest to also include the unadjusted risk ration. Moreover, it will be useful to present actual data for RR of the high cognitive stimulation, and all covariates that were controlled for in both analyses in Table 4 & 5, rather than simply indicated 'non-significant'.

iii. Please check the analysis and interpretation (Table 4 and page 9). Should the results be 'odds of having low consumption (relative to either medium or high) for medium cognitive stimulation (compared to low stimulation) is significant. It is not clear why the authors extend the interpretation of this finding as, 'This indicates that higher levels of cognitive stimulation are inversely associated with consumption of junk food.' What is the risk ratio between the high cognitive stimulation vs low (no data shown)?

iv. What is the superscript 'c' for in Table 4?

v. Was BMI-Z also another outcome? It appears that the analysis was done but no data were shown. Since this is one outcome declared in the objective, the data must be presented even they are negative results.

vi. It is also a concern that the relation between the predictor and BMI-Z may not be direct, and operated through dietary intake (proxy by junk food consumption) as well as PA, the analysis needs to be better thought out.

b. Please consult your biostatistician on both analytical needs, presentation of data/results, and interpretation for all these analyses.

5. Discussion

a. The sentence, 'Analysis of cognitive stimulation ……high level of cognitive ….is associated with lower level of junk food consumption can be qualified if analysis commented in 4 (a.ii) is clarified and correct.

6. References

a. The reference Strauss and Knight, 1999 is an electronic version. Please add the web link.
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.

No

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

No

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