**Reviewer’s report**

**Title:** Association of parental body mass index (BMI) with child's health behaviors and child's BMI depend on child's age

**Version:** 0 **Date:** 24 Jan 2018

**Reviewer:** Jennifer Kuk

**Reviewer's report:**

The authors examine the differences in the relationship between parental body mass index with child health behaviors and BMI by the child's age. This is an interesting study, but I have suggestions to improve the clarity of the paper.

%95th BMI is a bit of an awkward term and it was not very clear to me what this was until I read the CDC website. Please consider revising your description in the abstract and methods for clarity and choosing an alternative abbreviation. At first, I thought your were referring to the prevalence of obesity in your abstract. Further, if you read the abbreviation as written it is not grammatically correct or meaningful (percent 95th BMI).

In the abstract, you conclude about an 'epidemic' but do not refer to what factor you are referring to. As written, it would appear to be healthy behaviours, but I assume you are referring to obesity?

Please use person first language regarding obesity (i.e. you should not use the term 'obese').

The Introduction is written to suggest that longitudinal follow-up will occur (ie. 'behaviors and BMI would be expected to diminish as children grow older'). This should be revised.

The other issue with the introduction is that you go into great lengths to speak of the mother-father differences in the relationship with child obesity and behaviours, but you do not actually examine it. In fact, it does not appear that parental sex was even adjusted for in the model.
Units should be included in the results text for all numbers presented.

This sentence makes a judgement that obesity and lifestyle factors are synonymous, and should be revised. "Due to the inclusion criterion in TX for children to be ≥85th BMI percentile, the TX children had a higher mean %95th BMI, less frequent FV intake, more frequent SSB intake, more hours of screen time, and a lower proportion participating every day in ≥60 min/day of PA, compared to the MA and CA children."

I am a bit confused at how the authors arrived at the conclusion that 'In the present study, parental BMI was positively associated with FV intake in boys'. From table 4, it appears you are only reporting a significant P-BMI*age3 effect.

In the conclusion "Higher FV intake in middle school boys with higher parental BMI could be explained by greater overall frequency of food consumption, including more fruit and vegetables, with larger parent body size". One of the issues with your measure is that you do not express the amount eaten, particularly relative to the recommended amount. In fact, one could conclude the opposite, that the parents with higher BMI may be more concerned with obesity in their sons and provide a better diet as reflected by their higher FV consumption.

"In the present study, parental BMI was positively associated with FV intake in boys and SSB intake in girls, but not with child's screen time and PA". Unless I am misreading table 4, parental BMI is associated with more PA in boys. This does not appear in the discussion.

One of the main issues is that you conclusions do not appear to be entirely based on your findings, but are reinforcing your assumption that diet and exercise are the sole cause of obesity, and that the parents are to blame. However, you did not examine parental behaviours, only parental BMI and made the assumption that higher BMIs are reflective of poor lifestyles. Further, you show very few significant pathways that go from the behaviour to child BMI independent of the parental BMI. These generalized statements reinforce the negative stigma associated with obesity and your conclusions and statements need to be buffered in the context of your results and your data to substantiate your views. Specific examples are listed below, but are by no means exhaustive.
"One potential explanation for our results is that long exposure to unhealthy parent behaviors in a shared unhealthy home environment may result in higher %95th BMI in older children and increase the association with parental BMI."

"An assumption in interpreting our results is that parental BMI is an indicator of long-term parental dietary, PA, and sedentary behaviors, and that those health behaviors would influence their child's health behaviors and BMI [11, 12]."

"These results indicate that childhood obesity may be affected by inheritable factors, parental behaviors, and a child's own unhealthy behaviors. Thus, interventions for the prevention and control of childhood obesity may consider focusing on simultaneously changing the health behaviors of both parents and children"

Your conclusions suggest that childhood obesity may be affected by parental behaviours, but you did not examine that. Given that you have looked at the child's behaviour, which was not generally significantly associated with child BMI, then what this would mean is that the parental BMI or behaviours as you suggest, influence their child's body weight more than what the child does. So in other words, are you suggesting that the parents tv viewing doesn't cause the child to watch more TV, but causes their child to gain weight?

"Our findings are also consistent with the notion that early life (before age 5) may be the best opportunity for interventions to prevent childhood obesity, before children develop their own unhealthy behaviors and weight status." However, for most of the behaviours, they are not significant predictors of Child BMI independent of parental BMI.

**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.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
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No
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