Reviewer's report

Title: Tracking of eating patterns and overweight - a follow-up study of Norwegian school children from middle childhood to early adolescence

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Reviewer: Emma Patterson

Reviewer's report:

This is a well-written paper that addresses an issue on which relatively little has been published, and what has been published has showed quite mixed results, so more research is welcome. The research question is well-defined.

The methods used are generally appropriate. However, a problem common to papers using factor analysis/PCA is that the factors are identified based on the use of “scree plots, eigenvalues and the interpretability of the components” which involves a good deal of subjectivity and makes the method hard to replicate. This does not mean that it is not a good method, but the reader must be aware of these limitations.

- Major Compulsory Revisions

As this is a follow-up study, I assume the parents were informed of the weight status of their children at the end of the first study (or perhaps they are informed automatically, perhaps weight status is regularly controlled in the Norwegian school system?). This would surely introduce a big risk of bias in how the parents reported the dietary behaviour in the follow-up study (over and above the usual risk of reporting bias which the authors do mention). What were the objectives of the study as explained to the parents? Were they given feedback on the child’s weight status? How might such a bias affect the results?

I realise that the first study is published but I can’t help wonder at one of the conclusions which is repeated in the background to this study that “the findings indicated parental modification of the diets of overweight children towards inclusion of more healthy food items”. The first study was clearly cross-sectional and therefore impossible to know if diet is modified because of weight status or if weight status results from diet, as was rightfully acknowledged by the authors in that paper’s discussion. I have read the original study and remain dubious of that particular conclusion. My suggestion therefore would be to remove this sentence which can be justified on the grounds that that particular conclusion is not really relevant to this paper. (A far more relevant result from that paper would be that the “Norwegian” pattern was positively associated with overweight, but which is in direct contrast to this paper!) See also Essential revision > Discussion >
Paragraph 5.

The extraction of four patterns at time II must naturally have been somewhat influenced by the four patterns found in the first study. Did the authors limit themselves to four in the second, or did they try with three, five etc.? Was the method and criteria for studying the scree plot, choice of eigenvalues etc. absolutely identical at both times? How much was the labelling of them influenced by the labels given to the first study (i.e. might they have been labelled differently if this was the first extraction)?

- Minor Essential Revisions

Abstract>Background

1) Would suggest you provide the relevant grade after the first instance of age as grades are not universal. A mix of ages and grades are used in the abstract.

Abstract>Methods:

2) Use of both “seventh-grade” and “7th grade” in abstract.

Abstract>Results:

3) “345 children remained normal weight” -> change to “345 children were still of normal weight”

4) “in cross-sectional and longitudinal analyses” -> change to “in either cross-sectional or longitudinal analyses”

5) Would suggest “The same four distinct eating patterns were identified at both time points” (preferred) or even “Four distinct eating patterns were identified at both time points, which were comparable over time”. On first reading it now sounds like four comparable patterns were identified, but that is not what is meant.

Methods> Subjects and study design:

6) The authors mention that this sample represents about half of the county’s 4th and 7th grade pupils – but if all the children were invited, and the response rates were 1045/1477 and 1095/1503 isn’t this closer to 70%? Or do they mean that half the counties 4th and 7th grade pupils participated at both time points? Please clarify.

Methods> Dietary information:

7) More information is needed about the measurement of the primary exposure. “63 different foods, comprising 39 food items, 11 types of drinks, 13 snacks and five main meals”. 63 foods or 39 foods? Does the 63 refer to the number of questions? How many questions in total? What is the difference between a food and a food item? Five main meals – is this five questions about main meals or really five main meals. If the latter; breakfast, lunch and dinner are fairly standard main meals but what are the other two? 13 snacks – snack foods or snacking behaviour between meals?
8) The authors state that the modified FFQ is appropriate for exploring dietary patterns but has not been validated for estimating energy. Was the original FFQ validated for either purpose? The authors are correct to conclude that the modified one is not suitable for estimating energy, but how can they be sure that it is suitable for the purpose it is used for?

Methods> BMI categories
9) It should be clarified here that the obese children were categorised together with the overweight children. This only becomes apparent in the discussion.

Methods> Statistical analysis
10) The scale for food and drink frequencies is explained, as is the one for meal frequencies, but not the scale 1 to 3 for snacking. They are given on a previous paragraph, but either all or none should be repeated here.

11) It is good that the authors describe the treatment of missing values. How many questions is 25%, and conversely, what percent is “two questions about meals”? See previous comment about level of detail of the FFQ.

12) The dependent variable in the logistic regression is described, but not the independent ones, as is done with the description of the linear regression.

13) Why is unchanged included with increased? Couldn’t unchanged just as easily be included with decreased? Should it maybe be a separate category? (Allowing for +/- a small change, for example.) Would the authors like to comment?

Discussion>Paragraph 2
14) This is the first actual description of the patterns and as such would be far better suited to the results section, where the reader is instead directed to the earlier study.

Discussion>Paragraph 4
15) The first sentence is quite biased. It was expressed more neutrally in the background as “difficult to demonstrate a consistent relationship”. Suggest you use this expression here too.

Discussion>Paragraph 5
16) The discrepancy between the conflicting associations between overweight and the Norwegian pattern in the two studies is rightfully highlighted. The explanation that it is “explained by individual changes in eating habits over the time period studied” feels a little sparse. Please expand. This is a significant issue and deserves more discussion. The conclusions from this study are that a Norwegian pattern (which was not associated with overweight) is desirable, whereas the conclusion from the earlier study where the Norwegian diet was associated with overweight was that the diet modifications were seen.

- Discretionary Revisions
Methods> Subjects and study design:
17) “rarely/never” and “never/rarely” are used interchangeably. Unless this is exactly how it was in the FFQ, please use just one.

18) A comment on the fact that the validated physical activity question comes in fact from a different country/population would be appropriate in the methods or discussion.

Methods> Statistical analysis
19) “The components were named… highest factor loadings within each pattern”.

20) “Spearman’s rho was used for correlation analysis”.

Results
21) In the description of Table 3, the modifier “negatively” or “positively” before “associated with” would ease in the reading.

Table 4
22) Listing the patterns in the same order as the previous study would ease comparisons for interested readers.

Figure 1
23) The text in the third box on the left does not match the third box on the right, i.e. the samples in both boxes are not comparable. Is this correct?

- Minor issues not for publication

Methods> Statistical analysis
24) “two times points” -> “two time points”

Results> Paragraph 1
25) “amount of variance”

Results> Paragraph 4
26) “times points”

Level of interest: An article of importance in its field

Quality of written English: Acceptable

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