Author's response to reviews

Title: Meal frequencies in early adolescence predict meal frequencies in late adolescence and early adulthood

Authors:

Trine P Pedersen (Tppe@niph.dk)
Bjørn E Holstein (bho@niph.dk)
Mette Rasmussen (mera@niph.dk)

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Author's response to reviews: see over
Thank you for giving us the opportunity to resubmit the paper entitled "Meal frequencies in early adolescence predict meal frequencies in late adolescence and early adulthood". We find the reviewers comments very useful and relevant and we have rewritten the manuscript in accordance with their advice. As a result of the reviewers comment we have conducted additionally analyses and for this we have invited a statistician Esben Meulengracht Flachs as a co-author to the article. Esben Meulengracht Flachs helped with the new statistical analyses, contributed to the revision of all parts of the manuscript and approved the final manuscript.

We have attached a document which gives a point-by-point response to the reviewers concerns. The manuscript is revised with tracked changes, and we have also attached a document without the tracked changes.

Yours sincerely

Trine Pagh Pedersen
PhD Student
Response to the comments from reviewer 1

Reviewer's report:
The purpose of this study was investigated if meal frequencies in early adolescence predicted meal frequencies in late adolescence and in early adulthood. This study is an interesting one, well written, well documented and it has potential interest for further publication. However, from the point of view of this reviewer, some questions must be clarified, namely:

Major Compulsory Revisions

Comment 1. Why were not evaluated the snacks? Why were not considered as a meal in this study?

Response: Thank you very much for your comments. It would of course also have been interesting to include snacks but we do not have any available data on snacking behaviour.

Comment 2. In the selection of covariates, why BMI was not included? Since it is described that meals frequency is also associated with obesity. Please test these relationships.

Response: Meal frequencies are associated with obesity but we do not know the causal relationship. Inclusion of BMI could mean that we control for a mediator which would result in a biased OR. We have added this in the discussion page 13, line 324-327.

Comment 3. In table 1, the significant differences between genders should be identified.

Response: We anticipate that you are referring to table 2? In the text line 176-180 the significant gender differences for daily consumption of breakfast, lunch and evening meal are mentioned but these values are now also added in table 2.

Comment 4. In table 3, how the authors explain the large amplitude of OR with breakfast consumption in ‘more seldom category’? and in table 4, with breakfast and evening meal consumption in ‘more seldom category than daily’ in men?

Response: We acknowledge this comment; however we hesitate to focus on the size of the OR-values because of the wide confidence limits. In our opinion, it is appropriate to focus more on the direction of the association rather than the magnitude of the estimates.
Response to the comments from reviewer 2

Reviewer's report:
Overall, this is a well-written manuscript assessing the relationship between meal frequency patterns at early adolescence with the same patterns at late adolescence and adulthood. It would be beneficial if authors could analyze their data using a proper longitudinal data analysis methodology (e.g. Generalized Estimating Equations) and provide the marginal effect over time of gender and family structure. Moreover, there are some issues to be addressed by them:

Comment 1. Abstract, line 34, 37 and 38: Add the corresponding confidence intervals for the reported odds ratios.
Response: The corresponding confidence intervals have been added to the text. Line 34-40.

Comment 2. Abstract, line 39-41: Authors should also report the estimated odds ratios and the corresponding 95% confidence interval.
Response: We have added the odds ratios and confidence interval where possible, line 40.

Comment 3. Introduction, page 4, line 81-83: Authors should remove this phrase since it does not offer much in their study objectives and should transfer it somewhere else in their Introduction.
Response: The phrase has been transferred to page 4, line 79-80.

Comment 4. Methods, line 89-91: Authors should report in their study limitations that there is report bias in the measurement of the recorded characteristics.
Response: You are probably referring to bias in self-reported data. We have added a line in the study limitations page 12-13, line 306-308.

Comment 5. Measurements, line 124-125: Authors should report that they socio-economical status assessment in age 27 could introduce bias in their analyses, since no SES was recorded at age 15 or 19.
Response: Thank you for your comment. It is correct that parental occupation was measured when the participants were 27 years old but the measure was retrospective and asked about the parents' occupation at age 50 which we consider a measurement of childhood social class. We have added this explanation in the manuscript page 5, line 131-132.

Comment 6. Statistical analysis: Besides the multivariate logistic regression analysis, it would be useful to assess the marginal effect of the exposure variables (meal frequency, gender and family structure) for the study periods overall and not only for all the possible combinations of the two-time periods. The estimated effects should be presented in an additional table.
Response: We acknowledge that GEE analyses would add useful information. We have now conducted both the GEE analyses and random effect models. The findings were consistent between the models and we have presented the random effect results. In the following lines the new method and results are presented. Page 2, line 43, page 7, line 149-156, page 8, line192-193, page 9, line 208-210, page 9, line 226-228, page 12, line 296-298. + table 6. In the article we have chosen not to display the estimates of the covariates as we think this will remove the focus in the article, but the covariates are illustrated below and the findings correspond to the findings in table 2.

Table 6. OR (CI 95 %) for less than daily meal consumption at age 19 and 27 years, random effect model

<table>
<thead>
<tr>
<th></th>
<th>OR for breakfast consumption less than daily at age 19 and 27</th>
<th>OR for lunch consumption less than daily at age 19 and 27</th>
<th>OR for evening meal consumption less than daily at age 19 and 27</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adjusted(^{a})</td>
<td>Adjusted(^{a})</td>
<td>Adjusted(^{a})</td>
</tr>
<tr>
<td><strong>Breakfast/lunch/evening meal consumption, age 15</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Several times a week</td>
<td>2.28(1.49-3.50)</td>
<td>1.95(1.57-5.03)</td>
<td>2.49(1.75-3.54)</td>
</tr>
<tr>
<td>More seldom</td>
<td>4.44(2.58-7.64)</td>
<td>2.81(1.57-5.03)</td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>27</td>
<td>1.40(1.08-1.82)</td>
<td>1.03(0.79-1.35)</td>
<td>0.15(0.10-0.20)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Men</td>
<td>1.48(1.10-1.98)</td>
<td>0.93(0.68-1.26)</td>
<td>0.65(0.46-0.91)</td>
</tr>
<tr>
<td><strong>Adolescent family structure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>1.26(0.88-1.81)</td>
<td>1.01(0.69-1.47)</td>
<td>1.35(0.90-2.04)</td>
</tr>
<tr>
<td><strong>Adolescent family social class</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social class I, II, III</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Social class IV V VI</td>
<td>1.21(0.91-1.63)</td>
<td>0.95(0.70-1.28)</td>
<td>1.03(0.74-1.44)</td>
</tr>
</tbody>
</table>

\(^{a}\)Adjusted for age, gender, adolescent family structure and adolescent family social class
\(^{b}\)Evening meal item was dichotomised because of few observations in the category "more seldom"

Comment 7. Statistical analysis, line 130-131: Authors should report if the assumptions for the application of chi2 test were met, and if not, if the reported p-values corresponds to Fisher’s exact test.

Response: The assumptions for chi2 test were met and this information has been added to the text page 7, line 138. It is not possible to report p-values from the Fisher’s exact test as the observations in the cells are too big.

Comment 8. Statistical analysis, line 142-145: Authors should explain more on the rational of using missing values as a different category for their meal frequency variables. They should also provide an appropriate reference.

Response: We have not used missing values as a different category for the meal frequency variables but we have mistakenly written that missing was kept as a separately category for the covariates. This is not the case and we apologize for the mistake. We have though run the analyses with the missing categories as a separate category and the estimates change slightly. We agree that the method could introduce some bias but there is few missing (family social class 7 and family structure 2) (Greenland S, Finkle W. A critical look at methods for handling missing covariates in epidemiologic regression analyses. American Journal of Epidemiology 1995; 142: 1255-1264). We have deleted the sentence and thank you for your comment.
Comment 9. Table 3, line 164: Table 3 does not correspond to Descriptive statistics table (Table 2).

Response: Thank you for your comment. The table has been moved to line 230.

Comment 10. Prediction analyses, line 172: Authors should report the p-value for each interaction term, here and everywhere else in the manuscript interactions are reported.

Response: The p-values for the interactions terms are now reported. Page 8-9.

Comment 11. Loss to follow-up: Authors should also examine the pattern of missingness in their data and report if it is Missing-At-Random or not. If so, they could perform multiple imputation in their dataset and provide more robust estimates.

Response: Thank you for your comment. We examined differences in baseline characteristics among participants with and without data at the first follow-up and at the second follow-up, and between first follow-up and second follow-up. Significantly more men than women were in the loss to follow-up group in all three analyses (p=0.028, p<0.001, p<0.001). We found a borderline statistically significantly larger proportion from the loss to follow-up group in low family social class (p=0.051). With regard to breakfast and lunch we found that a significantly larger proportion ate breakfast (p=0.002) and lunch (p=0.016) less than daily at age 15 year among the loss to follow-up group.

Further, we have conducted new analyses including all missing observations as worst case response and afterwards as best case response in the meal frequency variables and covariates. This did not change the magnitude or direction of the estimates.

A sentence about the new analyses have been added to the text. Page 10, line 241-244 and page 12, line 304-306.

We did not perform multiple imputation as we evaluate that the remaining variables in this survey, which has a rather broad scope, do not form a sound basis for doing multiple imputation.