Reviewer's report

Title: Energy and Macronutrient Intake among School Children in Bahrain

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Reviewer: Maria Waling

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1. The research question is relevant and is of importance as a base for future public health interventions in Bahrain.
2. The methods are not properly described and needs major revisions to become more clear.
3. The description of how the data was collected needs to be clearer.
4. The reporting of data need revision (see below).
5. The discussion and conclusions need revision (see below).
6. The title and abstract needs revision (see below).
7. The writing is acceptable but need some corrections.

MAJOR COMPULSORY REVISIONS

GENERAL
Be consequent in what unit you use when you refer to energy. In the text you use both “KJ” and “calories”.

TITLE
The title does not completely correspond to what the paper is about. Apart from energy and macronutrients you assessed food intake. Further, in the title it should be clear what study design has been used.

ABSTRACT
Background
Do you mean that there is a lack of information on the energy and nutrient intake of children in general or in Bahrain children? When you read the sentence you get a feeling that you mean Bahrain children but it is written as if it applies to children in general. This should be clarified.

Methods
In this section you say that “…the results were an average of the 3-day food record.” This is confusing since it says that you did a 24-h recall. This needs to be clarified.

INTRODUCTION
2nd paragraph
Is the following sentence really correct? "While studies have been conducted on the nutritional status and dietary habits of Bahrain children (12, 17-20), there is lack of information on energy and quantitative nutrient intake". When I look at the references referred to in the sentence it seems like they discuss mostly body composition, anthropometry and growth patterns and not dietary intake. Do they really discuss food intake? If they do, what is the difference from the present study and why is this study then important?

Another question about the above sentence is: what do you mean by “quantitative nutrient” intake? I’m guessing that you are referring to data such as energy, macronutrient and nutrient intake to separate it from data showing intake of different foods. I suggest that you do not use the terms “quantitative” and “qualitative” and just write what you mean e.g. energy and macronutrient intake or food intake. This should be done throughout the whole paper. It will make it easier for the reader to know what you are talking about.

You have to reformulate the following sentence: “Such information is essential to identify any deficiencies or excess in diet and suggests ways to improve the eating habits of children”. When reading this sentence it can be interpreted as if nutritional deficiencies could be found among the children. Deficiencies cannot be found through a dietary assessment method, to do that biological markers are necessary.

METHODS

Sampling

How was the study power calculated? What power did you reach, did you make any assumptions e.g. standard deviation?

The method needs to be complemented with more information:

• How many schools were included?
• How was the distribution between the districts of the schools that were chosen?
• Did you choose whole classes to participate or could it be a few children from each class at a school?
• How were the children invited?
• How was the number of students for the sub sample (approx. 500 students) chosen? What was the exact number of participants who did the 24 h recall?
• How come that not all approx. 500 children participated in the 24-h recall? What happened with the 13 children who did not participate?
• What were the reasons for drop-outs?
• A flow chart over the sampling procedure and participant flow is recommended since it would answer many unanswered questions in the method.
• Is the 99 % response rate based on the approx. 500 children or the 487 children? This has to be clearer.

Is the study ethical approved?

“Quantitative dietary data”
• Where were the interviews done? At the school?
• Who did the interviews? Were they trained? What was their profession?
• Were the interviews done with the mothers alone (for the children below 10 y old) or both the mother and the child? If the interviews were done with the mothers alone, how can that have affected the results?
• What days were included in the interview e.g. did you cover both weekdays and weekends?
• Interesting that few of the boy’s mothers showed up. Why do you think it was that way? Please discuss if and how this could have affected the results.
• How was the interview done, did they e.g. start with what they ate for breakfast the day before and continue until the morning the interview day?
• Did the children/mothers know that they were going to be interviewed about what the child had eaten the past 24 h? If they did, how could that have affected the results?
• The following sentence is unclear: “In addition, nutrient densities, which in this article cannot refer to percentage of calories from protein, carbohydrate, and fat, were assessed and compared to the DRVs recommended by the committee on medical aspects of food policy (COMA) (22).” Do you mean that you have calculated the percentage energy from e.g. protein from the total energy intake of the child? If that is what you mean it is important that it is made clear. Energy percent (E %) is a common expression for this and should be used throughout the whole paper.
• What were the reference intakes for energy intake for the children? Were they different for the different age groups? Were they different for depending on gender and physical activity level? In general you have to be clearer about what the actual recommendation is that you are comparing against.
• CSI and P:S ratio – I have to question the relevance of these formulas. There are so many other factors than food that affect blood lipids e.g. heredity, diseases, physical activity level that I would think that it is hard to say anything about the results of the quotients. If you decide to have these formulas you have to make clearer what the formulas say and if there are reference values.

“Food frequency data”
• Was the food frequency questionnaire done so that it included the 24 h interview?
• What about if the children ate something more than 1 time/day, what should they have answered then?
• Do fizzy drinks and coffee and tea have a similar nutrient profile?
• Were the foods categorized the same way it is described in the paper in the food frequency questionnaire? Or did you categorize the foods after the data had been collected?

“Data entry and analysis”
• I suggest that you change the header to “data entry and statistical analysis”.
• Delete the following sentence “Mann-Whitney test is the equivalent to t test and Kruskal Wallis is equivalent to ANOVA”.
• Delete the sentence “Values were rounded off to one decimal point.”

RESULTS
General: Decrease tables and figures substantially! Show only the ones that you consider the most important.

Did you have any more background information about the children e.g. weight and length so that BMI and BMR could be calculated? This would add interesting information to the study and it would enable to make some assumptions on the validity of the children’s reported energy intake.

“Nutrient intake”
• The header “nutrient intake” is a bit misleading. Energy and macronutrient intake is more appropriate. Nutrients to me are vitamins and minerals.
• You do not need all sub-headings, write about energy and macronutrient intake in the text together.
• It would be more interesting to look at E % (energy from protein/total energy intake of the child) i.e. the proportions, since you then take the total energy intake into consideration. This applies for all macronutrients and it is important that you write about this. When looking only at grams of e.g. carbohydrates, of course the boys will have a higher intake since they had a higher total energy intake.

“Nutrient density”
This paragraph should be integrated in the text about energy and macronutrients and you have to compare the E% against recommendations since this data will say more than just looking at grams. I can see that you have discussed this in the discussion but I think you should do the comparisons to recommendations in the results section and then compare to other studies in the discussion.

“Food frequency”
It is important to be aware of how the results can change depending on how you group the foods. If you for example group sweets, snacks and candies etc. as a whole group, this will be a big group. If you on the other hand decide to split e.g. vegetables into two groups and do not include fruits then these groups will be really small. A good thing to do is therefore to look at all groups separately at first to see if there are any food groups that stand out. Did you do this before you did the food groups?

DISCUSSION
General: The biggest disadvantage of this paper is the lack of discussion about the validity of the reported intake and all the errors that brings. It is not acceptable today not to even mention this and how this may have affected the results. This should be a big part of the discussion since the study is based on dietary data.
• It is not necessary with as many sub-headings as it is right now. See my comments about sub-headings in the results section.

Table 1
• You are referring to the EARs from the UK and these should be presented somewhere so that the reader knows what you are comparing the children's intake against.
• It is a bit hard to understand the footnotes in the table. In the text it e.g. says that there were a significant difference in energy intake between the genders but in the table there is no footnote “a” or “b” which stands for a difference between genders. How should the table be interpreted?
• Instead of "% kj from protein" you should write “Protein (E %)”. The same goes for all macronutrients.

Table 2
Can be deleted. It is enough to mention it in the text.

Table 4
Can be deleted. It is enough to mention about other relevant studies in the discussion.

Figure 1
Can be deleted. It is enough to mention it in the text.

Figure 2
• Cannot see the difference in colors between boys and girls.
• Choose some of these food groups that you think is of most importance to show the readers and then try to put them in the same figure.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

I declare that I have no competing interests.