Author’s response to reviews

Title: Validation of a food frequency questionnaire as a tool for assessing dietary intake in cardiovascular disease research and surveillance in Bangladesh

Authors:
Shirin Mumu (shirinmumu@yahoo.com)
Dafna Merom (d.merom@westernsydney.edu.au)
Liaquat Ali (liaquat304@gmail.com)
Paul Fahey (p.fahey@westernsydney.edu.au)
Israt Hossain (israt.ru84@gmail.com)
AKM Fazlur Rahman (fazlur@ciprb.org)
Margaret Allman-Farinelli (margaret.allman-farinelli@sydney.edu.au)

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1 The paper includes a lot of data – usefully considering the effects of adjusting the data and de-attenuation effects. However, it is quite challenging for the reader to understand how the data are changed by these manipulations and what the implications are for the use of the intake estimates. For example the vitamin C correlations for FFQ and recall intake estimates are not significant for two of the five comparisons – and range from 0.016 to 0.706 (Table 2). The overall validity (eg Abstract, Conclusion) of the FFQ is referred to in the paper – but the messages for individual nutrients clearly differ and they also vary significantly according to these adjustments. The implications of these differences (eg for any future use of the FFQ) needs to be clear.

In the ‘discussion’ section, we have discussed the rationale of each adjustment and how the correlation coefficients changed after each adjustment. We have included the variability of the correlation coefficient due to energy-adjustment and diattenuation in the abstract. We have also modified the conclusion. P 3, 4, 25; line 47-55, 64-68, 543-546

2 Greater focus is put on significant findings in some places in the paper – which makes it difficult for the reader to gauge their significance and it risks being selective. For example, nine biomarkers were considered: the three positive findings are reported in the Abstract but the three significant inverse associations (and three showing no associations) are not reported. Similarly, the Abstract gives a range for nutrients that showed moderately good correlations with
the recalls – but should also specify the nutrients with correlation coefficients that were below the stated range.

Thank you for this suggestion. Now we have included non-significant and off the mark results in the abstract.  P 3, 4; line 46-52, 58-63

3 Although FFQs often yield higher estimates of intake, the differences found in this study were very large for a number of nutrients. For example almost three-fold differences in intake were seen for vitamin C and folate. Whilst the FFQ may work well in terms of ranking individuals, its limitations in estimation of absolute intakes needs to be explicit (eg including comment in the Abstract). This has important implications for overall statements about the validity of the FFQ (eg line 381).

   We are aware about the absolute difference between the two methods and this is not a rare finding. We devoted one paragraph in discussion explaining the possible reasons of this difference. Now, we have modified the overall statement in the discussion.  P 18, 19-20; line 390-395, 417-425

4 I am concerned about the interpretation of the Bland-Altman plots, in particular, that there is underestimation at lower levels of intake. In many cases (eg energy) the differences between assessment methods at lower levels of intake appear reasonably close to zero – and it is difficult to justify this as underestimation. Please comment.

   We found that the reference values in graphs were not clear for energy and macro nutrients. Now we have fixed these. Although the visual inspection indicated the lower levels are closed to zero, the lower limit of agreement for energy is -1020 which is far from zero. However, we have modified the sentence in abstract as well as in discussion.

        P 4, 18; line 56-58, 394-395

5 Line 37 - please amend to indicate the number (146) of participants included in the analyses The sentence is modified, and the number of participants included in the analyses is incorporated.  P 3; line 37-38

6 Line 45 – needs to specify this is kappa statistic and that the data are unadjusted – and to give values for vitamin D and zinc

   Thank you. This sentence is modified according to the Editor’s suggestion.  P 3; line 44-46

7 Line 46 – underestimation is misleading without reference to the text – see above

   We have modified the line.  P 4; line 56-58
8 Line 48 – reporting of correlation coefficients for some nutrients is difficult to interpret without reference to the text as the reader is unaware of the large number of nutrients considered – please amend

This line is now modified. P 4; line 56-58

9 Line 53 – specify this comparison is in relation to serum ferritin

This line is modified, and we have included serum ferritin. P 4; line 60

10 Line 71-72 – this sentence is difficult to understand – please clarify Thank you. The sentence is modified now. P 5; line 82-83

11 Line 135 – please clarify ‘significant larger than’ Thank you. This line is modified. P 7-8; line 143-147

12 Line 221 – please explain why the UCFP method was used to assess urinary protein rather than urinary nitrogen. I am not familiar with this assay but having looked it up it seems to be used for diagnosis and treatment of diseases characterised by proteinuria. Is urinary protein measured in this way known to be related to intake? We have omitted total protein as it is not established biomarker of protein intake.

13 Line 246 – please specify whether the deattenuated data were also adjusted

It is unadjusted. We have included in the sentence and later we discussed how to calculate deattenuated correlation. P 13; line 256

14 Line 299 – please specify the number of nutrients that were considered to be stable – and the % difference thresholds used to classify them in this way

Thank you, Editor, for pointing out this. Here we only see the difference between baseline and after 3 months, not the stability. We have now modified the line. P 15; line 308-310

15 Line 314 – please change ‘better’ to ‘higher’ or equivalent

The word is changed in the text. P 15; line 325

16 Line 315 – please amend the text to explain ‘the value for protein declined…’

Thank you for highlighting this text. The sentence is now modified. P 15; line 325-326

17 Line 323 – the value -0.139 is not an increase
Thank you for pointing this. It is now corrected, and the sentence is modified. P 16; line 334-336

18 Line 358 – please specify that the comparison is with serum ferritin

Thank you, this sentence is modified. P 17; line 369-371

19 Line 370 – please amend – both correlations are comparable (around 0.2)

This line is now modified. P 18; line 381-382

20 Line 381-388 – the FFQ may not be appropriate for studying all nutrients – some show inverse associations with biomarkers and non-significant correlations; please amend text to clarify The text is amended. P 18, 19; line 398-402

21 Line 439 – agreement was not good for all nutrients – please amend text to reflect this

Thank you for the suggestion. The text mentioned the mean k value of all nutrients which shows fair agreement. However, now we have modified the line. P 21; line 453-454

22 Line 450 – the FFQ yielded estimates of folate intake, on average, 475ug above the 24h recall estimate (230ug). Can you conclude that the FFQ provides a ‘valid measurement of folate intake’? Thank you. We have removed that part of sentence to avoid controversy and modified the line. P 21; line 466-468

23 Line 498 – comment is needed on the inverse associations observed with protein biomarkers. We have included that protein showed inverse association with its corresponding biomarkers. P 23; line 514-516

24 Table 1 – please check average values – for some nutrients these are higher than the individual values (eg vitamin A: FFQ1 951ug, FFQ2 1360ug – average 1449ug)?

Thank you. Data of all nutrients is reanalysed and corrected. Table 1

25 Table 1 – one calcium value is incorrect. Thank you. Data is reanalysed and corrected. Table 1

26 Table 1 – FFQ zinc intakes appear incorrect (average 443mg) Thank you. Data is reanalysed and corrected. Table 1

27 Please check spelling of pyridoxine throughout. Thank you. Spelling of pyridoxine is checked and corrected throughout the manuscript.