Author’s response to reviews

Title: Association of major dietary patterns and different metabolic phenotypes: A population-based study of northwestern Iran

Authors:

Leila Nikniaz (nikniazleila@gmail.com)
Mahdieh Abbasalizad Farhangi (abbasalizadm@tbzmed.ac.ir)
Jafar sadegh Tabrizi (tabrizij@tbzmed.ac.ir)
Zeinab Nikniaz (znikniaz@hotmail.com)

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Author’s response to reviews:

Dear Editor;

We would like to thank you and also the reviewer(s) for their thorough evaluation of our manuscript. Our responses to each comment are as follow. All changes were highlighted in the text of manuscript.

Reviewer reports:

Daniele Maria Marcon, Dietitian (Reviewer 1): Obesity and overweight are public health problems and represent an important issue in Iran's population. These conditions are associated with dyslipidemia, hyperglycemia, insulin resistance and hypertension and we know that dietary behaviors play a crucial role in developing such complications.

The study aimed to understand the association of major dietary patterns and different cardiometabolic phenotypes. This is an important topic that could be used for planning prevention programs and improving nutritional education of population based on specific cultural and dietary habits.

The article presents some critical points:

- There are several grammatical errors and some sentences are not particularly clear

A: the manuscript is revised for grammatical errors.
- There are lot of abbreviations not explained. It would be better to write the complete words at least the first time they appear

A: we try to explain all abbreviations at first time they appear.

- Some passages are not very clear: it would be useful to describe more the dietary assessment (page 5, lines 100 - 105), how the dietary patterns were identified (page 6, lines 119 - 125) and the association between dietary patterns with MHO and MUHO (page 8, lines 162 - 166)

A: dietary assessment method, dietary pattern determination and associations are added to the method and statistical analysis sections (page 6, paragraph 1 and statistical analysis section)

- Some references to the tables are not correct: in dietary assessment (page 5, line 104) and also in results (page 7, line 131)

A: the references for tables in the text are corrected.

- It would be better to add in the discussion more details of table 2, explaining the differences in terms of composition of diet across metabolic phenotypes (calories, fat and protein intake are interestingly high also in non-obese group)

A: a paragraph about the mentioned result is added (page 9, paragraph 1)

Zhongshang Yuan (Reviewer 2): Thank you for the opportunity to review this manuscript. The authors use the cross-sectional data of a project to explore the association between dietary patterns and cardiometabolic phenotypes and find a dietary pattern related to some metabolic phenotypes, which the authors intend to apply to prevention programs. The findings may have guiding significance for improving metabolic status indeed, however, there are several problems in this article. I have attached my more detailed comments below in case the authors find them useful in refining their manuscript.
Page 2 - The background is similar to conclusion, and the conclusion is kind of overbroad. The study finds that animal dietary pattern relates to MHO (metabolically healthy obese) and MUHO (metabolically unhealthy obese) phenotype, so I recommend that the authors should rewrite conclusion more specifically from this prospective.

A: the conclusion is changed according to the reviewer suggestion. (Page 2, conclusion section)

Page 4 - The author put together the evaluation of biochemical parameters and some anthropometric measurements, so I suggest that this part should be measurements, which is more appropriate.

A: the title of this part is changed according to reviewer suggestion (page 4, paragraph 3)

As for anthropometric measurements, I don't know exactly how they were collected, but it should be measured at least twice and calculate the mean value to control the measuring error. Besides, the authors did not clarify some definitions, such as fasting blood sample and metabolic syndrome. I recommend that some necessary definitions should be included in this article so that readers could understand it better. And I suggest that the definition of metabolic syndrome (Mets) and how to categorize cardiometabolic phenotypes should be put together in a new part to make the structure of this article clearly.

A: many thanks for reviewer comment. All mentioned part are added to the method section. (Page 5)

Page 5 - The definition of BMI is repeated, I advise that this should be removed. In addition, table 1 is baseline characteristics of participants rather than defined food group.

A: the definition of BMI is removed and also the reference for table 1 in the text is revised.

Line 66, 104, 108, 124 - The authors simply said details were presented elsewhere, which makes the article incomplete and difficult to understand. I recommend that the authors should enrich the contents of this article so that readers could understand it better.

A: a description about these parts are added to the text. (Pages 4-6)
Page 6 to 7 - The description of table 1 is inconsistent with the data in table 1, and table 1 itself may have several mistakes. I suppose that the authors had mistaken the denominator when calculating proportions. And in line 131, table 3 should be altered to table 1. And the statement here is incorrect, either.

A: the data were analyzed again and the data in the table 1 revised accordingly.

Page 7 line 145 - Why did the authors categorize the participants according to tertiles of dietary pattern scores? And what is the stratification criterion? What if the sample size of each level was not enough after this stratification? I wonder how the authors deal with these problems and I wonder if the results in Table 3 are reliable. Furthermore, the authors seems to categorize the participants within one specific dietary pattern scores and failed to detect the association between different dietary patterns and the outcome.

A: we stratified dietary pattern scores to tertiles to determine the higher, medium and lower adherence to that dietary pattern. As a person could have high adherence to one more of the derived dietary patterns, we did not compare outcomes according to dietary pattern, instead we analyzed the association of each dietary pattern with the outcome and we showed that only animal dietary pattern had association with MHO and MUHO.

A: Factor scores were categorized in tertiles according to the distribution of participants with each pattern. So we had not the problem of different sample size in each level. This sentence is added to the text for more clarification. (Page 6, last paragraph, line 2). Along with other analysis we analyzed the data again and the results are true. As dietary pattern is a spectrum

Table 1 - The authors said final analysis was done on 504 participants, so I suppose that the numbers and proportions in this table are incorrect, the details marked in table 1. Or the authors did not illustrate the exclusion criteria clearly. In addition, I think table 1 is lack of some baseline characteristics mentioned before in this article. I recommend that the indices of defining Mets should be included in table 1, including BMI, hypertension, hyperglycemia and dyslipidemia.

A: statistical analysis is done again and the table 1 is revised and also the mean of mentioned parameters are added (table 1)

Table 2 - This table has the same problem with table 1, which is marked in table 2. And I suggest that the units of some variables should be included in the table and the digits of numbers should be the same. And there are several small frequencies in the table, I wonder if the authors had considered about the application condition when doing chi-square test.
A: table 2 is revised. We consider the small sample size in some cells and the statistic analysis of this part is added as a table footnote.

Tables in an article should be clear at a glance. However, in Table 1 and 2, the significant and insignificant p-values are all marked by * or ** according to the testing method, which will give readers an illusion that they are all significant. I recommend that the authors should mark the significant p-values only to make the results more clearly and readable. Besides, I suggest the authors to check the tables carefully and give a reasonable explanation.

A: the table is revised. We marked the significant values as a bold numbers.