Author’s response to reviews

Title: Water intake and intra-meal fluid consumption in relation to general and abdominal obesity of Iranian adults

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Author’s response to reviews:

Dear Prof. Collins,
Thank you very much for your letter informing us of your decision regarding the manuscript # NUTJD-19-00357 entitled "Association between water intake and intra-meal fluid consumption and odds of general and abdominal obesity". The manuscript has been revised according to the reviewers’ comments. Responses to the reviewer’s comments have been provided below. Revised texts have been highlighted. Thank you so much in advance.

Yours Sincerely,
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Reviewer #1
The article brings interesting new results of fluid and water intakes and odds of obesity in the Iranian population.
According to my opinion, the results of this article are misinterpreted, especially the use of the term association, which refers to the association between taking more than eight glasses of water in a day and the odds of general obesity. More correctly, we observed populations with taking more than eight glasses of water in a day and consuming 1-2 glasses of fluids between meals had higher odds ratios of general obesity. Term association is used for explanation of correlation between variables. In this study, the application of correlation analyses was not described. The term association here creates the impression that water intake can contribute to the development of obesity. Is it true?

Author: Agreed. Revised.

According to line 148-150, the difference between two populations with different water intakes was only 4.3%.

Authors: Yes, you are right. The difference in the prevalence of obesity is only 4.3%. However, it must be kept in mind that this is a crude prevalence, which has not been adjusted for other variables. As we all know, several factors can affect the prevalence of obesity. So, the same prevalence between the two categories, when it is just a crude prevalence, cannot indicate lack of association.

Further, according to BMI in Table 2, the population with intake more than 8 glasses in arithmetical mean was not obese.

Authors: Again, similar means cannot indicate lack of associations. Because this is a non-adjusted mean. Even if one finds a similar adjusted mean between the two categories, he/she cannot say that there is no association because means provide limited information on the associations. Similar means do not reflect that there is no association because individuals with a large BMI in one category might be placed with those with a low BMI in the same category. This would result in similar means; however, the percentage of individuals with abnormal BMI might be different between the two categories.

In addition to correctly used binary logistics analysis, it is necessary to make correlation analyses for explanation of possible associations of results between nutritional energy intake and substrates intakes and:

* water intakes
* fluid intakes
* weight
* BMI
* WC

I assume that associations will not be demonstrated by correlation analyses.

Authors: It must be kept in mind that energy intake has been considered as a covariate in this analysis. Therefore, any associations between dietary energy intake and exposure and outcome variables in this study have been controlled for. In addition, testing the correlations between variables is required for linear regression analysis, but not for logistic regression because in binary logistic regression analysis, one would work with categorical variables that might not be correlated with continuous variables.

Title:
To correct the title of the article as described above and add ... "of Iranian adults."

Authors: Thank you. Title was edited.

Abstract:
Line 7-8: Better formulation, repeated words in both sentences.
Authors: Revised (line 7-8).

Results:
Line 139-145: No statistical basis for the stated differences claims (t-test required).
Authors: P-values for the stated differences were added to the text (line 141-150).

Discussion:
To discuss whether caloric food intake was related to water intake, with BMI, greater body surface area and the need for cooling in obese with larger body surface area, with greater production of digestive juices in the digestive tract etc.
Reviewer #2

Abstract
Lines 13-14: Intra-meal fluid consumption was also questioned. I recommend using analyzed rather than questioned.
Authors: Agreed. Corrected (line 12).

Introduction
Lines 34-35: In 2015, a total of 107.7 million children and 603.7 million adults were obese worldwide (3). Can you report more recent data?
Authors: We added more recent data in this regard (line 30-32).

Lines 37-38: In addition to the involvement of several factors in the etiology of obesity, the contribution of water intake to weight gain and obesity has always been a question. This sentence is not very convincing.
Authors: Edited (line 34-35).

Lines 38-39: Water comprises about 60 percent of body weight. Do you mean that the human body comprises of 60% water?
Authors: Based on evidence, water comprises about 60% of human body weight and is critical for life. We provided a citation for this statement (reference number 5).

Line 40: Recommendations to lose weight suggested drinking a glass of water before a main meal. Can you provide a citation?
Authors: Provided (reference number 6).

Lines 43-44: Overall, much water intake was associated with a lower energy intake (6). More description is needed here.
Authors: More description was provided (line 40-41).

Lines 49-51: Most information on the water weight associations came from clinical trials, which are beyond the habitual intake of water in routine life. Please provide a supporting citation.
Authors: A supporting citation was added (reference number 6).

Lines 51-52: Observational studies linking water consumption to energy intake, weight and obesity are scarce. Please provide a supporting citation.
Authors: Added (reference number 11 and 12).

Lines 55-60: Supporting citations are needed.
Authors: Provided (reference number 13).

The introduction does not build a strong case for the rationale of this study. This section needs more structure and logical progression in the information presented. Why did this study specifically focus on water and no other types of fluid?
Authors: Water is the most commonly consumed beverage in the world. The association between other types of fluids including SSBs, coffee and tea consumption in relation to obesity has been extensively examined in previous studies. However, limited data is available on the association between whole-day water intake and intra-meal fluids consumption and obesity. This was added to the introduction section (line 59-62).

Methods
Lines 72-73: In the current study, participants whose total calorie intake was out of the range of 800-4200 kcal/day were excluded. Why? This needs further justification.
Authors: In this study, we excluded individuals with energy intake out of the range of 800-4200 kcal/day.
kcal/day due to under- and over-reporting of energy intake (line 74-76).
Lines 73-74: We also excluded subjects who lacked information on required variables. What do you mean by 'lacked information'?
Authors: In this study, participants that had missing data on any relevant variable were excluded from the analysis.
Intra-meal fluid intake. Did this include all types of fluid as well as water?
Authors: Intra-meal fluid refers to water consumption between meals and other types of fluids were not considered in this study.
Line 79: Requested to report. How did the participants report this?
Authors: Daily water consumption was assessed through the use of a pre-tested questionnaire by asking questions about the average number of glasses of water consumed in a day. Intra-meal fluid consumption was also analyzed. Participants were requested to report the average number of glasses of water they usually consume in a day. The possible choices to this response were &lt;2, 2-5, 6-8 and &gt;8 glasses of water during the whole day. In addition, they were asked to report their usual intra-meal fluid intake (&lt;1, 1-2, 3-4 and &gt;4 glasses). This was explained in the main text (81-85).
Line 84: Self-reported questionnaire. Was the questionnaire developed by the study and validated?
Authors: The questionnaire developed, designed and validated specifically for this study. A reference was added (reference number 19).
Were participants instructed how to measure their waist circumference?
Authors: The anthropometric measures in this study were self-reported, however, subjects did not measure their waist circumferences. They reported the size of their trousers, and we estimated the waist circumference from that. In our validation study (Aminianfar et al., Arch Iran Med 2020), it seems that this questionnaire provides reasonably valid measures of anthropometric indices.
Line 88: National Cholesterol Education Program (NCEP) guidelines. Can you provide a citation?
Authors: Added (reference number 18).
Line 93: Pilot study on 200 individuals from the same population. Can you provide a supporting citation?
Authors: Added (reference number 19).
Results
Line 166: 'In the crud model': Typo here.
Authors: Thank you. Corrected.
Discussion
Lines 193-194: A systematic review demonstrated that water intake was associated with reduced energy intake and therefore obesity prevention (6). How many studies were included in this review?
Authors: That systematic review included 6 clinical trials of energy intake in the absence and presence of drinking water, 18 clinical trials of energy intake in the absence of beverages or water, and 4 epidemiologic studies of water intake influencing energy intake.
Lines 199-200: Therefore, to provide recommendations to general population, it seems that observational studies are needed. I would recommend revising this sentence to- Therefore, further evidence from observational studies will be important for informing recommendations that are applicable to the general population.
Authors: Thank you. Revised (line 201-203).
Lines 200-201: Although the information on the association between water intake and obesity are not huge. This needs to be rephrased it is unclear.
Authors: Corrected (line 203-204).
Lines 201-202: 'The association of water consumption with other chronic diseases gained substantial attention in the literature. Can you provide supporting citations?
Authors: Added (reference number 27 and 28).
Lines 202-203: For instance, high total water intake was protectively linked with chronic kidney
disease. What was a high water intake in this study? What age were the participants? Please provide a supporting citation.
Authors: More information was added to the text (line 205-207). Reference number 27 was added.
Lines 203-204: Cardiovascular disease was not associated with water consumption (22). Do you mean the incidence or prevalence of cardiovascular disease was not associated? What age were the participants?
Authors: In a cross-sectional study on adults aged 20-84 years, high total water intake (>4.3 L/day) was protectively linked with chronic kidney disease, however, cardiovascular disease was not associated with water consumption. This was edited in the revised version (line 205-209).
Lines 204-205: Higher water intake was also prospectively associated with increased risk of mortality among women, but not men (23). How much higher was the water intake? How much was the risk raised?
Authors: Cutoffs for quartiles 1-4 were as follows: for total water, &lt;2525, 2525-3372, 3373-4487, and &gt;4487 mL, respectively; for plain water, &lt;444, 444-944, 947-1772, and &gt;1772 mL, respectively. In women in the highest quartile of total water intake, there was a small increase in risk of all-cause mortality (HR: 1.24; 95% CI: 1.09, 1.42).
Lines 212-213: In Iranian culture, water ranks the first among common beverages consumed with meals. Do you have a supporting citation for this statement?
Authors: Added (reference number 30).
Lines 215-217: Based on prospective cohort studies, replacement of sugar sweetened beverages or fruit juices with water resulted in a lower weight gain over 4-year period (28). You have said cohort studies but only provided one citation.
Authors: This study (34) had provided results from three cohort studies. However, we added another reference in this regard (reference number 12).
Lines 219-220: Given the findings of this study, it seems that large number of study participants drank caloric beverages, instead of water, between their meals. How can you come to this conclusion? This needs greater explanation.
Authors: This sentence was removed.
Lines 222-223: Considering the adverse effects on digestive system, most investigators recommended that drinking beverages along with meals should be restricted. This sentence is not phrased accurately and seems out of context in this paragraph.
Authors: Thank you. This sentence was removed.
You need to acknowledge the limitations of using self-reported water intake data.
Authors: Agreed. Added to the discussion (line 233-234).
Why do you use the term 'general' obesity rather than obesity throughout the manuscript?
Authors: Obesity includes “general obesity” and “abdominal obesity”. The obesity term alone refers to both types of obesity, therefore, we preferred to use the term of “general obesity” and “abdominal obesity” separately to examined the relationship between water and both types of obesity.