Author’s response to reviews

Title: Healthy Eating Index versus Alternate Healthy Eating Index in relation to Diabetes status and health markers in US adults

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Author’s response to reviews:

Dear Editor,

Thank you for forwarding the reviewers’ constructive comments regarding our manuscript. We are delighted to be informed that our manuscript is potentially acceptable for publication in your prestigious journal. After careful consideration, we made the essential revisions on the manuscript according to the reviewers’ comments and questions. As shown below, we provided a point-by-point response with detailed explanation for each comment and question. In addition, we highlighted the modified sections, which can be found in the revised version of our manuscript. We hope that the revised manuscript is now suitable for publication. Please inform us if there are any additional revisions needed.

Reviewer #1 (E-mail)

1. Authors might want to consider using people first language. "Adults with diabetes, adults with pre-diabetes …"

Agreed with the reviewer’s comment. We used person-first language such as “adults with diabetes”, “adults with prediabetes,” and “individuals with diabetes” instead of “diabetics” or “prediabetics” throughout the entire manuscript.
2. Lines 85-87, please clarify this sentence in association with previous sentence. Why is it useful to explore both AHEI-2010 and HEI-2010, given that the HEI-2015 exploring diet quality in relation to disease have been tailored to model AHEI?

Agreed, the reviewer made an excellent point. We provided more explanation to clarify the sentences.

“The most recent U.S. dietary guidelines (DGA 2015) have somewhat moved in the direction suggested by the AHEI For instance, the HEI-2015 has included added sugars and saturated fats as two separate components instead of being combined into empty calories, which is one of the components in HEI-2010 [13]. However, excessive calories from alcohol (part of empty calories) has been removed in the HEI-2015 whereas the AHEI-2010 includes alcohol as a separate component to assess dietary quality. With the exception of these minor changes, most of the HEI-2010 components are kept in HEI-2015 [13]. The AHEI-2010 provides additional food and nutrient components that are neither found in HEI-2010 nor HEI-2015. Therefore, it is useful to utilize the HEI and AHEI indices to examine their association with health or disease outcomes, such as T2DM.”

3. Lines 91-93, please clarify this sentence - explain "reflects a critique…"

Agreed, the reviewer made an excellent point. We provided more explanation to clarify the sentence.

“However, the AHEI-2010 reflects a critique of the HEI-2010 where it provides dietary recommendations that better improve health risk factors, and it has shown to more strongly predict chronic disease risk (i.e., T2DM) and mortality [11,12].”

4. Lines 123-135, consider rewriting this section converting "The study will…" to "The authors or researchers will…"

Agreed with the reviewer’s comment. We converted the beginning of the sentences from “this study” to “the authors” throughout the paragraph.
“In this study, the authors hypothesized that the AHEI-2010 is more strongly associated with T2DM than the HEI-2010 dietary pattern. To the authors’ knowledge, this was the first study that compared the HEI-2010 and AHEI-2010 scores and their associations with diabetes status in a representative sample of U.S. adults. Moreover, there is limited understanding of the differences of individuals’ dietary behavior at different stages of disease development. For that reason, the authors defined diabetes status into three categories: nondiabetes, prediabetes, and diabetes (T2DM). The authors were interested in looking at differences in dietary quality, and how they are associated with the stages of disease development. Furthermore, few studies have investigated the relationship between dietary pattern and physiological health markers. A better understanding of the biological basis of health markers (i.e., lipid profile) in relation to diet may better explain the differences in metabolism of individuals with and without chronic disease. In addition, this may provide an insight to develop more effective treatments for diabetes.”

5. Please provide tables - unable to fully compare results as written to tables

We apologize for the inconvenience. We re-uploaded the tables and supplement tables as two separate documents under “Attach Files” in the submission system. Please refer to the documents “Tables” and “Supplemental Tables” in the Journal’s submission system.

Reviewer #1 (PDF)

1. Well written paper. there are a few comments should be taken into account. Thanks

We appreciate the positive feedback. We did our best to address and taking into account all the comments listed in the e-mail and PDF file.

2. Line 26 Abbreviation of what? you should once and then write the abbreviation

Agreed, the respected reviewer’s comment is valid. We made the correction and wrote “type 2 diabetes” and then abbreviated (T2DM) in the abstract.
3. Line 60 Reference please?

Agreed with the reviewer’s comment. We included the references in the revised manuscript as requested.

“One type 2 diabetes mellitus (T2DM) is a serious clinical and public health concern in the United States [1,2].”


4. Line 61 When in 2019?

Agreed with the reviewer’s comment. We included the date as requested.

“In 2012, it is estimated that about 12.3% of U.S. adults age 20 years and older had diagnosed or undiagnosed diabetes [3].”

5. Line 65 Any recent percentage?

Agreed with the reviewer’s comment. We included two recent published references related to the percentage of CVD among adults with T2DM.
“It is estimated that at least 68% of people aged 65 years or older with T2DM die from CVD in the United States [5]. Moreover, a recent meta-analysis by Einarson and colleagues (2017) examined the prevalence of CVD among adults (mean age 63.6 ± 6.9 years) with T2DM during the time period between 2007 and 2017 in multiple countries, including the United States [6]. Results indicate that about 32.2% of individuals with T2DM were affected by overall CVD. CHD was found to be the most prevalent contributor of CVD mortality (about 21.2%) among individuals with T2DM [6].”

6. Line 98 It is a long sentence and need to be divided please

Agreed with the reviewer’s comment. The sentence is divided into smaller sentences for more clarification.

“The AHEI-2010 incorporates distinct features from the HEI-2010. For example, the AHEI-2010 pays more attention to fat quality (i.e., intakes of omega-3 fats and polyunsaturated fats), promotes intake of nuts and legumes, and considers moderate alcohol intake (Male: 0.5-2.0 drinks/day; Female: 0.5-1.5 drinks/day) as beneficial to health regardless of disease status (i.e., diabetes). In addition, the AHEI-2010 recommends to limit intake of red and processed meats and avoid added sugars (i.e., sugar-sweetened beverages and fruit juice) [12].”

7. Line 109 In which group, country and age please

Agreed with the reviewer’s comment. We provided more information (including group, country, and age) regarding the meta-analysis published by Schwingshackl, L., & Hoffmann, G. (2015).

“The meta-analysis included seven reported studies (six in the United States and one in Europe) on T2DM as the main disease outcome, with age ranging from 30 to 79 years, among individuals from different ethnic groups including Caucasian (European), non-Hispanic White, African
American, Hispanic, and Asian. Of these studies, the main result indicates that diets that score highly on the HEI, AHEI, and DASH are associated with a significant reduction in the risk of T2DM (22%, P < 0.05) [18].

8. Line 111 Can you please summarize these studies? which age group, country, gender and the main result

Agreed with the reviewer’s comment. We included a paragraph that summarizes each study and included pertinent information (age group, country, gender, main result) as requested.

“McCullough and colleagues evaluated whether or not the AHEI-2005 would predict risk reduction for chronic disease (including CVD, cancer, or nontraumatic death) more effectively than the HEI-2005 [11]. The study was conducted in the United States among females aged 30-75 years enrolled in the Nurses’ Health Study (NHS), and males aged 40-75 years participated in the Health Professional’s Follow-up Study (HPFS). The main result indicates that the AHEI-2005 was more effective in predicting chronic disease risk than the HEI-2005. The overall risk reduction with the AHEI-2005 (highest quintile compared to lowest quintile) was lower among men and women, with 11% and 3%, respectively [11]. In 2012, Chiuve and colleagues used the NHS/HPFS datasets to assess the associations of the HEI-2005 and the AHEI-2010 with major chronic diseases, including T2DM [12]. The main result indicates that the AHEI-2010 was more strongly associated with T2DM risk than the HEI-2005. Although both indices were significant, the association between HEI-2005 and T2DM risk was attenuated after adjustment for confounders [12]. In 2015, Jacobs and colleagues compared associations of the HEI-2010, AHEI-2010, DASH, and Alternate Mediterranean Diet Score with T2DM risk [17]. The study was conducted in the United States among men and women 45-75 years who participated in the Multiethnic Cohort Study. The main result indicates that the AHEI-2010 was associated with a 12% risk reduction of T2DM among white individuals. However, the HEI-2010 was not significantly associated with T2DM risk [17].”

9. Line 151 nut-22.2 What is this??

We apologize for the unclarity. To clarify, this is one of the items in the STROBE-nut checklist Nut-22.2 – “Provide data collection tools and data as online material or explain how they can be accessed.” As requested by the Editor, we had to follow the STROBE-nut checklist and specify
each item throughout the entire manuscript. The STROBE-nut checklist is available online: Lachat C et al. (2016) STrengthening the Reporting of OBservational studies in Epidemiology – Nutritional Epidemiology (STROBE-nut): an extension of the STROBE statement. Plos Medicine 13(6) http://dx.doi.org/10.1371/journal.pmed.1002036 pdf or online version.

10. Line 212 nut-7.2 THis is not clear what it means, can you please clarify?

We apologize for the unclarity. To clarify, this is one of the items in the STROBE-nut checklist Nut-7.2 – “When using dietary patterns or indices, describe the methods to obtain them and their nutritional properties.” As requested by the Editor, we had to follow the STROBE-nut checklist and specify each item throughout the entire manuscript. The STROBE-nut checklist is available online: Lachat C et al. (2016) STrengthening the Reporting of OBservational studies in Epidemiology – Nutritional Epidemiology (STROBE-nut): an extension of the STROBE statement. Plos Medicine 13(6) http://dx.doi.org/10.1371/journal.pmed.1002036 pdf or online version.

11. Line 292 why 4 reading?

Agreed with the reviewer’s comment. We provided explanation on why NHANES collects four blood pressure readings.

“The majority of participants had at least three consecutive readings each for systolic and diastolic blood pressures. The fourth reading was taken in case the previous blood pressure measurement is interrupted or incomplete [36].”

12. Line 516-518 Should be deleted or in the result section

Agreed with the reviewer’s comment. The sentence has been removed in the discussion section in the revised version of the manuscript.
13. Line 703 you should point out which health markers were significant and which were not

The respected reviewer’s comment is valid. We re-stated the significant health markers in relation to diabetes status in the conclusion section. However, we did not re-state the non-significant health markers because of the following:

1) Based on the authors’ findings, we are making a concluding statement that “diet” is a possible risk factor for T2DM development, due to the presence of “significant” health markers in relation to both dietary quality and diabetes status.

2) All of the health markers that the authors examined in the study were found to be significant, except for CRP. The authors specified both the significant and non-significant health markers in the results section under the subtitle “Health Markers and Diabetes Status” (also shown in Table 6).

“Although total HEI-2010 and AHEI-2010 were not significant predictors of T2DM as expected, the role of diet should not be dismissed as a potential factor in the development of T2DM. There are factors that point to a role of diet in the development of T2DM: the significant differences in means of health markers across HEI-2010 and AHEI-2010 scores, and the significant differences in means of health markers (i.e., BMI, WC, total cholesterol, HDL, LDL, TG, insulin, blood pressure, comorbidity score) by diabetes status. These findings indicate that diet has some influence on T2DM development, leading to the conclusion that better tools are needed to assess dietary intake in persons with diabetes and to better understand the role of diet in T2DM risk.”