Reviewer's report

Title: High quality dietary patterns beyond the Mediterranean Diet and depression in the SUN Project.

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Reviewer: Jerome Sarris

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A very interesting and important research paper.

Minor essential/Discretionary level suggestions:

Abstract:
* State the actual population sample size from which the 1,051 cases were drawn from.
* Clarify "extreme quintiles"
* Clarify and justify the "L-shaped" effect. See comments below on this

Intro:
* It is true that we can't yet directly correlate these patterns with micro/macro nutrient intake, but it should be clarified that your current research model can't validate this, only if there are general outcome differences between patterns

Methods:
* I appreciate study methods have been published elsewhere but suggest still providing a brief synopsis on what the purpose of the SUN cohort is and what questionnaires where that they filled out

* I am curious as to how the MDS scale was grouped into: low (score 0–2), low-moderate (score 3), moderate-high (score 4), high (score 5) and very high (6–9). Seems weighted strangely re very high and some having singular scores per rating group

* Consider reframing "softer and gentle approach" wording for PDP.

* Am I right in thinking that all of the sample are classified into variant levels of all three scales? e.g. data not used just for one pattern (I don't think this is the case but just checking)

* I am unclear about the following: "The percentage of confirmed depression was 74.2%; (95% CI=63.3 to 85.1). The percentage of confirmed non-depression was 81.1% (95% CI = 69.1 to 92.9)." Please clarify this further re what conformation meant or how it was achieved.

* Spelling- a participants was considered "a" user of vitamin...
Results/Discussion:

* "These findings suggested that deficient nutrient intake related to suboptimal adherence to these high-quality dietary patterns was probably the key factor to account for the raised risk of depression among participants with lower adherence."

Can you really say this is directly related to "nutrient deficiencies" without specific data to intake of individual nutrients?

* Am I right in thinking with the results and the figures that the moderate adherence to these diets confers the strongest association with depression prevention and that it is weaker with greater adherence or just maintains (with vegetarian pattern)? If so, need to better explore the reason for this (can’t see how it is nutrient related). Some people posit that such effects can be due to psychological elements of neurotic or obsessive traits- e.g. this pattern is seen in physical activity and exercise, with the highest activity actually having worse mental health.

* "However, the MDS is rich in monounsaturated fatty acids and fish (omega-3) and the AHEI-2010 in nutrients such as polyunsaturated fatty acids"

I would have thought as omega-3s are also polyunsaturated fats that this sentence is moot.

* On page 19 there is discussion about the micronutrients and the equivocal association with depression, but then on page 20 there are new references and justification for the link between some of these e.g. Zn and depression. Suggest harmonising this passage so that your position based on the evidence is clearer

* I appreciate that the AHEI takes into account processed foods, sugars, and trans fats, and that you have done previous work showing this type of diet effects mental health outcomes; could a scale have been used applying this approach- focusing on the 'elements' of a poor diet. In other words seeing if your results reflect a higher consumption of processed and fast foods?

Figures:

* Suggest the need for a footnote clarifying the axis numbering.

* Also, it would be good to discuss in more detail what these differential regression patterns are telling us in the discussion.

*I am still unsure how this relates to an L-shaped curve meaning it is related to micronutrient deficiencies.

Quality of written English: Acceptable

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

No direct conflicts of interest are identified