Reviewer’s report

Title: Ideal cardiovascular health and the subclinical impairments of cardiovascular diseases: a cross-sectional study in central south China

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Reviewer: Anna Chu

Reviewer's report:

This paper examines ideal cardiovascular health (CVH) and its association with various subclinical markers and biomarkers in a Chinese working population residing in Changsha, Hunan in south central China. In a cross-sectional analysis, the investigators found that better cardiovascular health was associated with lower levels of subclinical biomarkers and lower odds of having subclinical markers. While the results are not surprising, this study of a combined measure of CV risk factors and multiple subclinical markers highlights the potential pathways leading to CVD. However, interpretation of the implications of the results in the discussion could be better developed and focused. Further detailed comments follow.

1. While male versus female comparisons are interesting, given the paper's overall objective and CVH score as the main exposure being examined, Table 1 should be stratified by CVH score category to allow readers to view the distribution of subclinical markers/biomarkers across score categories. Also, the CVH metrics also display n(%), but the results only the %.

2. The CVH metrics included untreated blood pressure, fasting blood glucose and total cholesterol levels. How then were participants on hypertensive, diabetic and lipid-lowering medications classified?

3. What is the rationale for adjusting for alcohol consumption in model 3? Was this meant to be a proxy for socioeconomic status, hence adjusted with education? Defining alcohol consumption as current versus former/never may not adequately reflect its association with the markers studied compared with a measure that considers quantity consumed over some time period. As the proportion of study participants classified as "current" by CVH score is not reported, I also cannot assess whether this is necessary, but could explain the little differences in results between models 2 and 3.
4. The discussion could exclude some less important content and be better developed/revised to support the study's main message. E.g. including some discussion about possible reasons for differences in associations/effect sizes between different biomarkers/markers through incorporation of observed distributions in Table 1 and by CVH score would be insightful.

5. Line 274 seems contradictory with what follows. Did the authors expect that > 56.4% (sum of 1, 2 and ≥3) of participants would have at least 1 subclinical marker, hence explained by the study population being young and healthy? How does the prevalence of these markers compare to other studies?

Minor points:

6. Abstract - It would be more informative to provide the source of the study population (south central China) in the background rather than the conclusions.

7. What was the participation rate? As the study population comprised of white-collar workers in Changsha, a limitation is the external validity and the first sentence of the Discussion referring to the Chinese population as the study population is misleading.

8. Methods (line 184) - Should "odds ratio" be "beta coefficients" since the results are from a linear regression model?

9. Methods (line 194) - Description of the 14-point CVH score could be better worded to understand that it was derived by assigning 0-2 points to each of the 7 metrics based on an individual's status on each metric.

10. Results (line 220) - It is not clear what the authors mean by the sentence "This could have possible implications for the PAD population, in which there exists a female preponderance." Suggest deleting, or re-wording and moving to the discussion if the authors wish to emphasize implications of higher PAD rates among females.
11. Figure 2 - Since odds ratio are presented, the x-axis should be on an exponential scale.

12. References should be provided for the statements in line 316 and 318.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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