Reviewer's report

Title: The impact of a healthy lifestyle on Disability-Adjusted Life Years: a prospective cohort study

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Reviewer: Fernando Rodríguez-Artalejo

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Among 33,066 apparently healthy men and women followed during 12 years within the EPIC-NL study, the authors found that non-smoking, having a BMI < 25 kg/m², being physically active and the adherence to a Mediterranean-style diet are associated with longer life in a good health.

This manuscript is well written, the methods are correct, and their results make a useful addition to the literature on the health effects of lifestyle scores, because they show, for the first time, that the accumulation of certain health behaviors translates into a progressively lower disease burden, assessed with individual-level DALYs.

DISCRETIONARY REVISIONS

1. In my view, it is a pity that the authors opted not to include moderate alcohol consumption within the studied behaviors, because some of the previous publications on lifestyle scores did include it and it is a relevant issue for public health. Authors argue that “We did not include alcohol intake in our health behaviour score… because… a moderate alcohol intake is associated to lower CVD risk but on the other hand related to a higher risk of breast cancer”. The use of a summary measure of health, such as DALYs, allows for estimating the net effect resulting from the benefits and harms associated with moderate alcohol intake, particularly when the results are disaggregated by sex. Thus, I suggest to include results on moderate alcohol intake (versus no or excessive intake) and to create a score with 5 health behaviors. It would also be interesting to check whether the dose-response between the lifestyle score and lower disease burden also holds after including moderate alcohol intake.

2. Authors might comment on possible reasons why, compared to being inactive, the relative effect on disease burden of being moderately inactive is similar to that of being active (table 2).

3. It would be worthwhile to comment on reasons why the association with disease burden was stronger for smoking and BMI than for physical activity and Mediterranean diet. Is it because of the dichotomous categorization used for the studied health behaviors? (If other categorization were used, would the results have been similar?) Is it because once BMI is taken into account, the role of physical activity is only minor? As for the small association seen for the Mediterranean diet, could it be due to the exclusion of alcohol from the
Mediterranean diet score? in fact, in a previous paper (BMJ 2009;338:b2337) Trichopulou showed that the main contributor to the reduced mortality associated with the Mediterranean diet was alcohol intake

4. Readers may benefit from a brief comment on how the weights to calculate YLD were estimated for the different diseases. It may have had certain influence on study results.

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests