Reviewer’s report

Title: More to Gain: Dietary Energy Density is Related to Smoking Status in US Adults

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Reviewer: Neal David Freedman

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The authors examine the association of dietary quality, as assessed by dietary energy density, with smoking status using publicly available data from the nationally representative NHANES study.

1. In my opinion, the authors over-interpret previously published data on the potential benefits of micronutrients and antioxidants to disease. For example, in the introduction the authors write that smokers require more antioxidant vitamins, such as Vitamin E, C, beta-carotene, and selenium. In the discussion, the authors argue that low Vitamin C and beta-carotene are risk factors for cardiovascular disease and cancer. In the conclusion, the authors write that their results have important implications for "oxidative stress reduction in an at-risk population." However, most epidemiologic studies have not found associations between micronutrients and antioxidants and cancer or other diseases. Furthermore, the paper fails to mention the adverse effects of supplementation on current smokers that were found in the ATBC and CARET trials. With the results of those trials in hand, substantial caution on the role micro-nutrients in disease is warranted, particularly for smokers.

2. The current cross-sectional study indicates that cigarette smokers likely have worse diets than never smokers. This is not a new observation and coincides with prior data that cigarette smoking coincides with other negative health behaviors including a lack of physical exercise, sedentary behavior, alcohol drinking, and a range of other behaviors. It would be helpful for the authors to place their results in the context of this past work.

3. Nevertheless, as this is a cross-sectional study, the correlation of smoking and dietary patterns does not equal causation and does not necessarily mean that changing diet would benefit smokers. Further care should be taken in the way that the authors present their results.

4. In a related point, in the discussion section, the authors write that the inclusion of formers smokers allows them to evaluate associations with dietary change and abstinence. However, the cross-sectional nature of the current study precludes interpretation of cause and effect.

5. The authors also write in their conclusion section, that their results "suggest that consumption of a diet low in energy density may be a successful strategy for preventing
weight gain following smoking cessation." However, the cross-sectional results of the current study do not address this question.

6. It is not clear why this particular dietary pattern was chosen, as opposed to other ones that could be examined using the NHANES data.

7. Introduction and discussion should be shortened. For example, the authors discuss barriers to smoking cessation—however the relevance of this admittedly important topic to the current study is not clear.

8. "any amount of cigarette consumption" in the abstract and results is misleading, as the authors required participants to smoke 100 cigarettes per day to be considered a smoker.

9. Participants who smoked less than 100 cig/day should be classified as never smokers not non-smokers. Non-smokers could either be never and former smokers.

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.

No

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I am able to assess the statistics

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