Author's response to reviews

Title: Influence of health behaviours on the incidence of infection and allergy in adolescents. The AFINOS cross-sectional study.

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Author's response to reviews: see over
We thank both reviewers for their comments and in the paragraphs below answer to their suggestions.

Firstly, the writing of the text should be revised along the manuscript. A thorough revision of language has been done as suggested.

Secondly, new statistical analysis should be performed. The authors should calculate the z score for BMI (SDS-BMI), as a more accurate index than BMI for obesity in the adolescent population. This new information should be included in table 1 and also is to be considered for the adjustments: age, sex or SDS-BMI. For instances in table 2 and 3 a new column or line should be included after the adjustment for age, sex and BMI-SDS.

The authors agree that the BMI z-score is a more accurate measure to evaluate adolescents in the age range included in this work, and consequently the corresponding Z values have been calculated according to the norms of Sobradillo et al., (2004) for Spanish population. The mean and SD values have been included in Table 1. A column has been included in Table 3 after adjustment of the model by the three factors, (age, sex and Z score of BMI). The outcomes were no different after this new adjustment and the corresponding data have been modified in the results section with the updated values (page 11, lines 1-2). Adjusting by age, sex and Z score led to a significant inverse association between infection incidence and fruit consumption that in the previous analysis (sex and age adjusted) was only a trend. The new result has been added in page 10 lines 21-22. However, we believe that adjusting the model by Z-score is not appropriate when analyzing the association between allergy symptoms and weight status category, since this last variable and Z-score have a very strong correlation. Thus, Table 2 was not modified.

Moreover in figure 1 the confidence interval should be drawn and indicated for each measurement. It is not clear whether this model was also sex and age adjusted. Changes in figure 1 have been done as suggested. This model was also sex and age adjusted and the figure legend has been modified to include this fact.

In table 4 refers only to infection symptoms or also to allergy symptoms? There was a mistake in this table’s title: Table 4 refers to allergy symptoms and not to infection symptoms. The authors thank the reviewer for pointing it out.

More details are to be included in the Data analysis section (page 8-9). Specifically, the factors included in the fully adjusted model (lines 17), the variables that were log-transformed (p.9, line 2), the explanation of the meaning of the third model (p.9, line 6). Changes have been made in the data analysis section in order to clarify the process and also to incorporate a new model (the sex, age and Zscore adjusted model) as suggested by the reviewer (Page 8, lines 14-25). However, the health
behaviours that were included in the fully adjusted model are not specified in this section, but only in the results section as they were known only after the first analysis of the data had been performed. Thus, the health behaviours that were included in this fully adjusted model are enumerated in the result section, page 11, lines 3-4.

IgE, leptin, and all the interleukins were log-transformed for normalization of the variable’s distribution. This has been stated in “data analysis” section (page 9, lines 9-10)

The linear regression analyses performed with biological variables as dependent variables have been explained with more detail (page 9, lines 13-17), however the specific variables included as independent variables in the analysis are identified in the results section (page 11, lines 22-24) as they were known only after the first logistic regression analysis of the data had been performed.