Author’s response to reviews

Title: Prevalence and factors associated with overweight and obesity among adults in Hawassa city, Southern Ethiopia: A community based cross-sectional study

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Author’s response to reviews:

Point by point response to the comments of the reviewers

Reviewer I

Comment 1: the English requires (primarily grammatical) corrections in some places.
Response 1: the manuscript is now thoroughly edited.

Comment 2: Results, line 30: Here you report 28.2%, later on (Results, line 225) you report 28.0%
Response 2: Sorry for this typographical error. Now it is corrected.

Comment 3: Results, line 37: I know that in regression analyses the term "predictor" is a correct designation for an independent variable, but in the context of a cross-sectional study, "predictor" may be misunderstood by the reader and implicate causality. Therefore I would recommend, using another expression regarding the association of physical activity and overweight/obesity.
Response 3: comment accepted and modification made

Comment 4: Page 6, line 89: "51.9% were adults 15-64 years of age" are 15 year olds already considered adult?
Response 4: Corrected. It was a typographic error. The study participants were adults 18-64 years of age.

Comment 5: Page 6, line 101: "using single population proportion formula". For all non-epidemiologists, please give a brief explanation what this means.
Response 5: Explanation is now added.

Comment 6: Page 7, line 123: Please add a reference for the DHS questionnaire
Response 6: reference added

Comment 7: What kind of FFQ has been used? Was it an already existing validated questionnaire or was it a proprietary tool?
Response 7: As we could not get a validated FFQ, we developed and used our own tool. The same is now stated in the ‘data collection’ sub-section of the methods part. Further, in the methods section, this has been mentioned as one of the limitations of the study.

Comment 8: Page 8, second paragraph: With regard to page18, line 289, why didn't you measure waist circumference?
Response 8: Our interest was on the general level of obesity, rather than central obesity. That’s why we did not collected data on waist circumference.

Comment 9: Page 8, line 142: I would recommend writing BMI $\geq 25$ to $< 30$
Response 9: corrected

Comment 10: Ethical considerations: Has the study been registered in any study register?
Response 10: The study was not registered.
Comment 11: Data analysis: Please report your $\alpha$ level for significance for the final logistic regression model ($\alpha = 0.05$ for two-sided tests)

Response 11: comment accepted and modification made

Comment 12: Page 14, line 210: here you mention sugar sweetened beverages, this should also be reported in the methods section. Please give a more detailed description on how sweets and sugar (and sugar sweetened beverages) were assessed, especially against the background of the importance for overweight and obesity. Furthermore, was the consumption of coffee and tea divided into with and without sugar? I almost can't believe that no one consumed sugar more than once a day!

Response 12: Coffee and tea consumption was divided with and without sugar. The one reported in table 3 is consumption of coffee and tea without sugar. This explanation is now included in the method section. Yes, it is surprising that the data showed no one consumed sugar more than once a day.

Comment 13: Page 18, line 298: developing instead of developed?

Response 13: corrected

Comment 14: Page 20, line 332: I have never heard of the "flat slope syndrome" and could not even find a clue on Google, could you give me a short explanation? You should mention "social desirability".

Response 14: A flat-slope syndrome is a specific type of social desirability bias commonly encountered in retrospective (reported) dietary assessment methods. You can get more on this specific bias from different articles including the following two old articles.


However, as the reviewer suggested we have now used the more generic term “social desirability bias”
Reviewer II

Comment 15: Introduction: The bulk of the introduction present global data on overweight prevalence and change over time, which is well known and could be condensed. The authors rationale for investigating prevalence in urban Ethiopia is that it hasn't been reported before/recently (2016 national prevalence is reported). What is the rationale for examining the suite of risk factors (e.g. physical activity, diet patterns) that you analysed? Do you have cause to believe the well-reported associations between these risk factors and BMI would be different in your population?

Response 15: The recent Ethiopian Demographic and Health Survey (DHS) 2016 determined the magnitude of overweight and obesity both in urban and rural areas of the country. However, limited information is provided on the underlying drivers of the problem. While the general risk factors for overweight and obesity are known; the magnitude and strength of association of the factors, and hence their practical significance, may vary from one setting to another. That’s why we have undertaken this study.

Comment 16: Results: How well does the sample assessed represent the adult population of the city? Were some groups over or under-represented?

Response 16: As we compare the socio-demographic characteristics of the sample presented in table one with the natural competition of the study population, we did not observe major under- or over-representation. However, as we studied only 20% of all the clusters (kebeles) in the town, under- or over-representation cannot be entirely excluded.

Comment 17: In keeping with the aims of the study, I think the results should be re-ordered, so that after sample characteristics, the prevalence of ow/ob is reported. The next aim of the study is look at odds of ow/ob by risk factor. The descriptions of the prevalence of the risk factors is quite long for a non-aim; suggest putting these data in a table and just highlighting key information in the text.

Response 17: We disagree with the opinion of the reviewer. As we understand, describing the study sample based on socio-demographic, level of physical activity and dietary characteristics; then presenting the prevalence of overweight and obesity and finally describing the output of the multivariable analysis is the proper way of organizing the results section. Here, it is important to also note that we have summarized the findings of the multivariable analysis just with one paragraph. We don’t think it will be too long for readers.
Comment 18: Discussion: In the Discussion, many words are used repeating the study results. These could be condensed, and more weight given to how the study results compare to previous literature outside Ethiopia. Is it what we find in other countries? Also reflect on how the risk factors compare to each other - which had the strongest odds? If we had to pick just one or two to intervene on (and some of your risk factors are not modifiable), which should we target?

Response 18: The concern of the reviewer is right: we have now made the following modification: (1) the first paragraph that was intended to summarize the key findings of the study is now entirely removed; (2) few sentences that unnecessarily repeated the results are removed and (3) a paragraph that compares one risk factor with the other is added.

Comment 19: Line 36: Correct overweight/obesity' to 'overweight/obese'.

Response 19: corrected

Comment 20: Line 36: Promoting these healthy lifestyle habits rarely translates to weight change. Suggest instead focusing in the conclusion on the relative impact that each risk factor has on BMI (which strongly predict BMI, and which don't really seem to be associated).

Response 20: In the seventh paragraph of the discussion section, now we have tried to give focus to selected predictors based on their prevalence and strength of association with the outcome

Comment 21: Line 57: The authors state that the increase in NCDs is known to be caused by increases in risk factors listed. Please provide appropriate citations that provide evidence of this causal association, and that the risk factors prevalence has risen over the same period as the NCDs increase. The current citation (a WHO fact sheet) does not suffice to support such a strong statement.

Response 21: The concern of the reviewer is right. The citation is now changed.

Comment 22: Line 66: The authors state overweight causes increased blood pressure, cholesterol and insulin resistance. My understanding is the relationship is bi-directional, e.g. insulin resistance can predict BMI, as BMI can predict IR.

Response 22: The concern of the reviewer is right. But the interest of the paper is not on the reverse causation between BMI and insulin resistance. That’s why the bidirectional association is not discussed there.
Comment 23: Lines 52, 67, 69, ect: Throughout the introduction, when presenting prevalence of conditions, please also state the population the prevalence applies to. I presume most of these are global estimates, but it would be good to state for clarity.

Response 23: comment accepted and modifications made

Comment 24: Line 66: Please elaborate on the statement 'About 3 million people

Response 24: additional clarification is now provided

Comment 25: Line 67 die each year as a result of being overweight or obese'. I presume BMI is not the direct cause of death, but death from other causes (e.g. stroke, infarction) is attributed to being due to BMI?

Response 25: comment accepted and modification made

Comment 26: Line 71: The percent change in overweight/obesity over 40 years - 85% - is striking. Can the authors include in brackets the 1975 combined prevalence, for completeness/information?

Response 26: comment accepted and modification made

Comment 27: Line 74: Please add a citation for where these prevalence data came from.

Response 27: comment accepted and modification made

Comment 28: Line 84: Much of the detailed information about Hawassa could be moved to supplementary material.

Response 28: corrected
Comment 29: Lines 124, 127, 133: Add citations for the scales used. If they are not validated/published, please specify this

Response 29: Citation is added for the DHS questionnaire. The GPAQ already cited as reference no 11. The FFQ is not a validated/published one so we didn’t put any citation.

Comment 30: Line 120: How were the selected adults approached and recruited into the study? Presumably they participated at home? How long did the questionnaire & ht & wt measurements take?

Response 30: Some clarifications are added. Really, we didn’t note the time individual height and weight measurements took

Comment 31: Line 129: I don't understand from this description how the pattern of consumption was scored. It seems frequency of consuming each of 12 items was scored on a six-point scale, but then was a total score generated? If so, how?

Response 31: No, we did not generate any composite score. For each of the 12 food groups considered, the frequency of consumption was independently presented into six ordinal categories (more than once per day, once per day, 3-6 times per week, 1-2 times per week, 1-2 times per month and less than once per month). The same information is now provided in the data collection sub-section.

Comment 32: Line 135: How was the overall activity level (L, M, H) derived from the three separate context activity levels? Can you describe what levels of activity are considered low, moderate and high (e.g. 30 minutes of activity that makes heartbeat rise?)

Response 32: The WHO calculation guide of Total Physical Activity is added in the supplementary material. The operational definition of L,M,H is also added in page 8 line 137

Comment 33: Line 142: Add in the BMI formula wt/h2

Response 33: corrected
Comment 34: Line 145: Suggest including a supplementary table describing how the independent variables were measured in the questionnaire (what were the response options?)

Response 34: details are included in the supplementary material

Comment 35: Line 146: Why was overweight and obesity combined into a single category, instead of looking at the risk for each separately?

Response 35: we decided to combine the two categories into one assuming that the risk factors for both (overweight and obesity) are the same. Further, from sample size and statistical analysis points of view, considering the ‘obese’ as a distinct category (which had sample size less than 30) was not feasible to us.

Comment 36: Line 157: What were the covariates in the adjusted models? Can you clarify if the multivariable models were run separately for each risk factor (i.e. adjusted for covariates), or if all risk factors were entered into the same multivariable model. I presume the first.

Response 36: We rather did the latter. As described in the methods section, at the beginning multiple bivariable analyses were run for each of the variables and then variables that had less that p-value less than 0.25 were taken to the same multivariable model. To avoid similar confusions, the sentence is now rewritten (data analysis sub-section).

Comment 37: Line 174: By 'response rate', do you mean the [number of people who participated / number of people approached to participate]? It may be a coincidence that the response rate of 92.7% is the same as [number of people who participated / post-hoc calculated target sample size], so please clarify. I believe you should report the former, not the later.

Response 37: We meant the earlier one. In order to avoid similar confusions we have now rephrased the sentence.

Comment 38: Line 187: The description of the FFQ in the methods should be updated to mention it also captured breakfast and out-of-home data (if I'm interpreting this right?)

Response 38: breakfast skipping and out of home consumption data is already included in table 2. The FFQ is about the frequency of consumption of the different food items, not meal frequency
Comment 39: Line 234: It's not clear from the methods what the 24 variables are? I count 17. Please include a supplementary table showing the odds ratio and p-value for all variables considered for inclusion in the multivariate model (and therefore, which 10 have a p<0.25).

Response 39: The variables were rather 27, it is important to note that frequency of consumption of the 12 food groups was considered as 12 independent variables. The same remark is now given in the ‘variables of the study’ sub-section. The 10 variables that were included in the multivariable analysis are already listed in table 4.

Comment 40: Line 241 onwards: Are the odds ratios presented adjusted odds ratios? Please specify.

Response 40: yes, we presented the adjusted odds ratios. A short note is now added at the beginning of the paragraph.

Comment 41: Line 249: Please move Table 4 from supplementary material into the main manuscript. Add to the table footnote the covariates in the adjusted model. Please add to Table 4 the remaining diet variables (meal frequency, practices of skipping breakfast, behaviour of eating away from home, frequency of consumption of fast foods).

Response 41: Comment accepted and modification made. As described in the result section, only the ten variables that showed p-value less than 0.25 in bivariable analysis were considered for the multivariate model. Accordingly, the outputs of the ten variables are presented in table 4.

Comment 42: Line 273: Please add a citation to support the statement there are no meaningful difference in dietary intake of men and women.

Response 42: Sorry, for putting this confusing sentence there. Our intension was not to claim males and females have equal dietary intake. It was a kind of conditional phrase, which wants to emphasize the lower nutrient requirements of females and its implication for overweight and obesity. In order to avoid similar confusions, we have now removed the sentence.

Comment 43: Line 286: Line 222 says the prevalence of sedentariness was 21.6%

Response 43: Sorry for this silly error. Now we have made the required correction.
Comment 44: Line 293: Are these results reported in the results section? Avoid introducing new results in the Discussion section.

Response 44: Comment accepted and modification made