Author's response to reviews

Title: An update on overweight and obesity in rural Northeast China: from lifestyle risk factors to cardiometabolic comorbidities

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An update on general and abdominal obesity in rural Northeast China: from lifestyle risk factors to cardiometabolic comorbidities

Dear editor,

Thank you for your kind letter regarding the above referenced manuscript. We revised the manuscript in accordance with the reviewers' comments, as summarized below. All changes in the main document are highlighted in red.

This manuscript has been extensively edited by a native English-speaking scientist. The language style and usage have been improved and grammatical as well as spelling mistakes have been corrected.

Thank you for your time and consideration for our work. We look forward to hearing back from you.

Sincerely,
We thank the reviewers for their careful evaluation of our manuscript, which has strengthened this submission. Below, please find your comments in black, followed by our responses in blue.

Reviewer 2:

Major suggestions:

Comment 1: please find the file (http://www.strobe-statement.org/fileadmin/Strobe/uploads/checklists/STROBE_checklist_cros) to make sure the article meets the standard of STROBE report for a cross section study.

Response: Thank you very much for the kind suggestion. We have carefully read the STROBE statement, and added some parts according to the checklist in the revised manuscript. For example, we added the setting of the study and re-wrote the process of population selection. Also, we added some definitions that we failed to mention in the original paper as well as some other details. All the changes were highlighted in red in the revised manuscript.

Comment 2: Smoking as a protective factor should not be included in the result part of the abstract for this is not the focus in the study and a spurious association may exist.

Response: Thanks a lot for the kind advice. We deleted the smoking-related part in the abstract in the revised manuscript.

Minor suggestions:

Comment 1: the wrong-matched number of participant institution should be modified and the number of village, county and town should be confirmed to make a balance for the total sample.

Response: Thanks a lot for the correction. We made a mistake during writing the paper. It was 8-10 villages from each town which were selected. We corrected this mistake in the revised manuscript.

Comment 2: A trend test should be added in table 3 for the ranking factors of age, education, physical activity, family income and sleep duration.

Response: Thanks for the suggestion. We added the results of trend test in table 3 for the ranking variables of age, education, physical activity, family income and sleep duration. The detailed results were highlighted in red in the revised manuscript.

Reviewer 3:
Major suggestions:

Comment 1: Compared with lots of data listed in tables, the method used in the present article is relatively coarse. For example: “study population”: why the age >35 were chosen? Are the area chosen and 11579 participants representative for the Liaoning area?

Response: Thank you very much for the kind advice. We chose the population aged # 35 years because they were the primary labor and main income provider in this rural area. The younger population had high mobility due to school or part-time jobs in cities, whose life styles might be affected. Also, many other studies investigated this segment of population, which facilitated comparisons. Regarding the representation, we believed that our study was conducted strictly using a multi-stage, stratified and random cluster-sampling design as described in the manuscript, thus the participants we chose were representative for the Liaoning rural area. We expanded the method section. For example, we added the setting of the study and re-wrote the process of population selection. Also, we added some definitions that we failed to mention in the original paper as well as some other details. All the changes were highlighted in red in the revised manuscript.

Comment 2: In the result part of “Baseline characteristics of study population”, the Ethnicity was also considered to be a factor. However, since there are so many ethnicities in China, and the sample size of ethnicity of “others” was too much smaller than that of “Han”, the information and conclusion from “others” should be carefully considered.

Response: Thanks a lot for the kind advice. We agreed that the sample size of ethnicity of “others” was too small. Therefore, we added “Also, the sample size of ethnic minorities was too small and the conclusion should be carefully considered.” in the discussion section to remind readers of this limitation. Since ethnicity was a basic variable, we chose to keep it in the results section.

Comment 3: Combined effects of general and abdominal obesity on the cardiometabolic comorbidities were analyzed and listed in Table 4. However, the reason for combined effects should be described in the background or the method part. Also in that Table, only abdominal obesity was combined with other factors, the correlation of general obesity with cardiometabolic factors should be also addressed.

Response: Thank you for the good suggestion. We reviewed some more references and added “Because BMI reflects a combination of both fat mass and lean mass and WC reflects a measure of central fat distribution, the combination of these two indexes might be a more powerful predictor for health risks. Incorporating evaluation of WC in addition to BMI in clinical practice was advocated by many previous studies [7,8]” in the background. Also, we re-analyzed the data and added the results for the correlation of general obesity with cardiometabolic factors in Table 4. The description of this outcome was added in the result section.

Comment 4: The title of the article should be reconsidered since overweight was also
involved and the correlation between body weight and cardiometabolic comorbidities were quite less studied.

Response: Thank you for the suggestion. Since obesity included both types, we changed the title into “An update on overweight and obesity in rural Northeast China: from lifestyle risk factors to cardiometabolic comorbidities” in the revised manuscript.

Minor suggestions:

Comment 1: The topic of this article is about obesity and cardiometabolic factors, however, no detailed information could be get in the result part of the abstract, the relationship between obesity and the cardiometabolic factors was even not mentioned in the conclusion.

Response: Thanks a lot for the advice. We added “Overweight and obese participants had significantly higher risks to develop prehypertension, hypertension, high LDL-C and low HDL-C compared with normal weight participants, while abdominal obesity was associated with increased risks of diabetes and high TG after adjusted for multiple factors. Compared with participants with a normal BMI and no abdominal obesity, the participants classified as abdominally obese and normal BMI; as abdominally obese and overweight; and abdominally obese and generally obese each had a progressive increase in the odds of hypertension (OR: 1.961, 95%CI: 1.154 to 3.331, OR: 2.744, 95%CI: 2.126 to 3.541, and OR: 8.990, 95%CI: 5.858 to 13.795, respectively) and high TG (OR: 3.165, 95%CI: 2.183 to 4.588, OR: 3.980, 95%CI: 3.322 to 4.755, and OR: 4.340, 95%CI: 3.574 to 5.271, respectively).” in the result part of the abstract and “General and abdominal obesity were associated with different subtypes of cardiometabolic comorbidities, the combined effects of which on the comorbidities dramatically increased” in the conclusion.

Comment 2: In the method part, the definition for diabetes was also not strict, type 1 diabetes and some other endocrinological diseases such as Cushing’s disease or hyperthyroidism that may cause body weight alteration should be also excluded in this study.

Response: Thanks for the suggestion. We agreed that it would be better to adopt a strict definition for diabetes, which excluded other endocrinological diseases. However, like most of other epidemiologic studies, we were not able to exactly exclude patients with type 1 diabetes, Cushing’s disease or hyperthyroidism among around ten thousand people, because these endocrinological diseases were based on more blood tests. Therefore, we added this limitation in the discussion section in the revised manuscript.

Comment 3: In results, the information in Tables is quite difficult to read, and the descriptions of the result are poor. More rigorous and scientific language should be used.

Response: Thank you for the suggestion. We revised some parts of the result section and invited a native English-speaking scientist to edit the manuscript. The language style and usage have been improved and grammatical as well as
spelling mistakes have been corrected.

Comment 4: Figure 1 is not necessary for the article since the data from urban areas seems nothing to with the data in this research.
Response: Thank you for the suggestion. We deleted figure 1 in the revised manuscript.

Comment 5: In figure 2, did “obesity” refer to “general obesity”?
Response: Thank you for the question. We changed “obesity” into “general obesity” in the revised manuscript.