Author's response to reviews

Title: Fast food consumption and its associations with obesity and hypertension among children: Results from the baseline data of the Childhood Obesity Study in China Mega-cities

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Author's response to reviews:

Dear Dr. Pallan,

Re: Fast food consumption and its associations with obesity and hypertension among children: Results from the baseline of the Childhood Obesity Study in China Mega-cities (PUBH-D-17-01414)

Please find enclosed the revised version of our manuscript together with our point-by-point response to reviewers.

We are grateful to you for your kind consideration of our manuscript, and to the reviewers for their constructive comments and suggestions. By attending to those constructive and helpful suggestions, we believe that our manuscript has been improved significantly.

Should you feel there are other changes needed, please do not hesitate to let us know.

Many thanks for your consideration. We look forward to an early response.

Yours sincerely,

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Response to reviewers

Reviewer 1:

Reviewer reports:

Charlotte Elizabeth Louise Evans, PhD (Reviewer 1): Review of fast food consumption in 4 mega-cities in China.

Thank you for giving me the opportunity to review this interesting paper. I have made some comments to further strengthen it.

Fast food consumption and its associations with obesity and hypertension among children: The Childhood Obesity Study in China Mega-cities

Title

Include study design in the title (cross-sectional study)

Response: We have added the study design in the title. In view of the data used in our manuscript was the baseline data of a cohort study, the Childhood Obesity Study in China Mega-cities, we have revised the title of the manuscript as "Fast food consumption and its associations with obesity and hypertension among children: Results from the baseline of the Childhood Obesity Study in China Mega-cities". (Title Page, Line 3, Page 1)

Abstract

Methods - include study design (cross-sectional) and age range and/or mean, SD.

Response: We have added the study design and age range of the students to the methods section of the abstract. The revised sentence is "Data of 1626 students aged 7-16 (11.6 ± 2.0) years and their parents in four mega-cities across China (Beijing, Shanghai, Nanjing, and Xi'an) were collected in the 2015 baseline survey of the Childhood Obesity Study in China Mega-cities". (Abstract, Lines 35-37, Page 3)

Results - p values not reported consistently. Report actual p values not cut offs ($p<0.05$) to 2 or 3 decimal places (dp).

Response: We have revised the p value to figure with 3 decimal places or showed ORs and 95% CIs instead of p values. (Abstract, Lines 43, 46-54 Pages 3-4)

Introduction

The first 2 sentences which are important in introducing the topic do not have any references. Please add references for both of these statements.

Response: We have added references. (Background, Lines 62-63, Page 5)

References are also needed in line 62

Response: We have added reference. (Background, Line 67, Page 5)

Line 76 - does this refer to children or adults? There is a well-established amount of literature in adults on sodium intake and BP.

Response: We have amended the statement and added references in the revised manuscript as "Some studies have reported that sodium intake was associated with elevated systolic blood pressure (SBP) and diastolic blood pressure (DBP) both among adults [15-20] and children [21-23]". (Background, Lines 80-82, Page 5)

Line 78-84 - very US focussed list of references. In UK there is published work on fast food and children in a longtidual study by Fraser et al, 2012, American journal of preventive medicine.

Response: Thanks for the suggestion. We have added the reference suggested. (Background, Line 85, Page 6; Reference 29, Lines 461-462, Page 22: Fraser LK, Clarke GP, Cade JE, Edwards KL. Fast food and obesity: a spatial analysis in a large United Kingdom population of children aged 13-15. Am J Prev Med. 2012, 42(5):e77-85.)

Line 80 - include more details about this very large international cross-sectional study. E.g. it included Chinese adolescents but not children. You also need to compare the results from that study with your results.

Response: We have revised the statement in the manuscript to "One multicentre, multicountry cross-sectional study of 199135 adolescents aged 13-14 years, including adolescents from Mainland China and Taiwan, and 72900 children aged 6-7 years, including children from Taiwan but without children from Mainland China, suggested that children's BMI was higher for those who consumed FF more frequently, however, adolescents' BMI was lower for those who consumed FF more frequently [13]." (Background, Lines 86-91, Page 6)

We also compared its results with our findings in the discussion section. "Inconsistent with results of the multicentre, multicountry cross-sectional study which showed FFC was positively associated with children's BMI but negatively associated with adolescents' BMI [13], our results found neither Western nor Chinese FFC was associated with child BMI (data were not shown)". (Discussion, Lines 271-274, Page 14)

Line 85 - 89 - split the references so it is clear which ones reported positive associations and which ones did not.

As there are quite a few Chinese studies I think further clarification is needed on what this study contributes to the existing literature.

Response: We have separated the references and cited as “Some reported a positive association [10,33-37] , while some did not [38,39]”. (Background, Line 95, Page 6)

Methods

Line 117 - define necessary data

Response: The revised statement is “The present analysis focused on 1626 students with key variables, such as students’ age, sex, FFC, height, weight, BP and maternal education level”. (Methods, Lines 126-127, Pages 7)

Line 118 - reference number for the ethics application is needed so it is possible to look it up, at least from New York. This is also needed under the separate section at the end of ethics approval.

Informed consent is usually from both parents and children under 16. Can you clarify when parent consent sought and when child consent sought.

Response: We have added a separate section about the IRB approval and reference number for the ethics application in the revised manuscript. Consent from parents and school administrators and assent from children were obtained before investigation. (Methods, Lines 128-130, Page 8)

Line 123 - were these physical examinations done for all students anyway as part of the school health programme or specifically for this study?

Response: The physical examinations were done specifically for this study. We have added this in the manuscript. (Methods, Line 135, Page 8)

Line 145 - it isn't clear whether the question was asked regarding the previous week or habitual intake. This is important as different answers will be given. It is a limitation of measuring intake of fast food and should be discussed under limitations.

Response: It’s about habitual intake. We used adopted usual practice in nutrition field, asking about in the past three months. In the Methods section, we have added the time period to the questions about the intake of fast food. The revised statements are “How often (times/week) did you eat a meal or snack in Western-style FF restaurants (e.g., McDonald’s, KFC, Pizza Hut) in the past three months?” and “How often (times/week) did you eat a meal or snack in a food stall or non-Western FF restaurant in the past three months?”. (Methods, Lines 158 and 160, Page 9)

In the Discussion section, we have revised the statement of the second limitation of the study. “In addition, we used modified food frequency questionnaires (FFQ) to estimate FFC instead of using 24 dietary recalls. There were both pros and cons of using these methods. Given the large sample in our study, we used FFQ. So, we could not obtain information on the quantity of FFC,

total daily energy intake and FFC's contribution to total daily energy intake among the children. It may affect the assessment of the relationship between FFC and health outcome". (Discussion, Lines 313-318, Page 16)

Line 148 - what was the rationale for the categories of fast food intake? Have other research groups used these cut offs?

Food stall is quite an ambiguous term. Could it include food items like noodle soup and other low fat dishes that are not fried? There is no one universally agreed definition of fast food and it is important that the reader understands what is included in this definition of fast food.

Response: The categorization and cut offs were based on data distribution. For the Western fast food, we defined it as food sold in these fast food chains, e.g. KFC, McDonald's, Pizza Hut. We defined food from non-westernized style quick service vendors, including food stalls, as Chinese fast food. There may be some non-fried food (e.g., steamed buns and noodle soup) sold from food stalls, which would make our estimate more conservative. We have added relevant discussion in the manuscript. (Discussion, Lines 299-305, Page 15)

Statistical analysis methods contains too many tests that are not necessarily included in the main research questions. Multiple testing could be an issue.

Response: All these analyses were carefully considered and to complement each other. We also tested and found our results were very robust.

Results

Line 175 - please include age range.

Response: We have added the description of participants' age distribution in the manuscript as "The 1626 investigated students were 7-16 (11.6 ± 2.0) years old". (Results, Line 189, Page 10)

Line 182 - this sentence implies you asked about habitual diet but in the methods it sounds like you asked them what they ate in the previous week.

Response: We asked students' habitual diet in the past three months. The questions about that were "How often (times/week) did you eat a meal or snack in Western-style FF restaurants (e.g., McDonald's, KFC, Pizza Hut) in the past three months?" and "How often (times/week) did you eat a meal or snack in a food stall or non-Western FF restaurant in the past three months?" We have added this information. (Methods, Lines 158 and 160, Page 9; Results, Line 195, Page 10)

There are too many p values related differences by gender. Gender was not even mentioned under your objectives.

Response: Examining gender difference is part of usual practice. We have added this aim in the objectives. "We also examined gender differences in FFC and health outcomes among Children". (Background, Line 102, Page 6)

Avoid using the ambiguous term 'all p>0.05'. all p values should be reported as actual p values to 3dp (most common).

Response: We have revised the p values to figures with 3 decimal places or showed ORs and 95% CIs instead of p values. (Abstract, Lines 43, 46-54 Pages 3-4; Results, Lines 200, 205, 207, Page 11)

Line 220 - what about child BMI and BP? Report even if not-significant.

Response: We have reported such results in our other paper. This was not the focus of this paper. Thus, we did not report the results in this manuscript.

Discussion

Line 248 - why is hypertension worsening in China while reducing in other countries? Sodium intake increasing while it is decreasing in other countries (eg UK)?

Compare results with the very large international cross-sectional study (Chinese adolescents in rural and urban areas?)

Response: We appreciate the comments. We have added the explanations and references about the contrary trends in mean BP and prevalence of hypertension in the manuscript. That is "These declines among U.S. children and adolescents might be associated with decrease in some nutritional factors (e.g., daily intakes of energy, carbohydrate, total fat, and total saturated fatty acids), and increase in daily intake of total polyunsaturated fatty acids and dietary fiber [9]. However, Xi et al. reported that the mean BP and the prevalence of pre-hypertension and hypertension among Chinese children aged 6-17 years increased significantly from 1993 to 2009, and the increases could be partially attributed to the increases in general and central obesity, salt intake and sedentary behavior, and decrease in physical activity [43]. " (Discussion, Lines 259-266, Pages 13-14)

Line 276 - id don't think you need this level of detail with CI in the discussion.

Response: We have deleted the details about ORs and 95% CIs. (Discussion, Line 297 Page 15)

More details on limitations needed, eg difficulties with defining fast food. Representativeness of this sample of urban children/adolescents,

The conclusions reads like a list and needs to be re-worded so it is more a synthesis of the results and recommendations for further research (or a separate section on further research could come after limitations).

Response: We have revised the limitations and conclusions section as the following:

Some limitations should be considered when interpreting our results. The definition of FFC was determined by eating in Western-style FF restaurants or eating a meal or snack at a food stall or in a non-Western FF restaurant. In this case, FF bought from supermarket and ate at home may have not been taken into account. In addition, we used modified food frequency questionnaires (FFQ) to estimate FFC instead of using 24 dietary recalls. There were both pros and cons of using these methods. Given the large sample in our study, we used FFQ. So, we could not obtain information on the quantity of FFC, total daily energy intake and FFC's contribution to total daily energy intake among the children. It may affect the assessment of the relationship between FFC and health outcome. Third, we could not make causal inference due to cross-sectional data structure. Fourth, the sample of our study were 7-16 years old students from four mega-cities across China, where is more developed than small cities and rural areas of China. Results of our study could not represent children and adolescents living in small cities or rural areas of China.

Therefore, more studies, especially longitudinal studies based on large national representative sample and with exact measure of quantity of FFC intake and its contribution to total daily energy intake, are needed to detect the association between FFC and health outcomes. We are collecting follow-up data which would allow us to conduct longitudinal studies in the future.

Conclusions

The rates of FFC, obesity and hypertension are high among children in mega-cities in China. The obesity rate was much higher in boys, and the FFC and hypertension rates were higher in older children. Maternal factors affect child FFC and health outcomes. Children of mothers with low education are more likely to have FFC, and with the increase in maternal BMI, children were more likely to be obese and have hypertension. Associations between FFC and obesity, central obesity, and hypertension were not detected. More studies are warranted. To fight the epidemic of obesity, hypertension, and increasing FFC among children, national and regional programs and policies are needed to create a healthy food environment and promote the development of healthy lifestyles in young people. School-based programs are also needed to provide effective health education and health promotion for children. More attention should be given to boys, and health education should begin at young ages and cover parents.

(Discussion, Lines 309-338, Page 15-17)

Minor/grammatical

Line 63 - delete 'such as'

Response: We have deleted the words. (Background, Line 68, Page 5)

Line 63 diet rather than eating?

Response: We have revised the word. (Background, Line 68, Page 5)

Line 164 - fitted not fit
Response: We have revised the word. (Methods, Line 176, Page 10)

Reviewer 2

Yajun Chen (Reviewer 2): This study examined status and risk factors for Western- and Chinese fast food consumption and their associations with health outcomes in Chinese children, and examined how maternal factors were associated with child health outcomes. It was concluded that rates of fast food consumption, obesity and hypertension are high among children in major cities in China. Maternal factors affect child outcomes. It is a very interesting well-written study in China to investigate the associations between FFC and health-related outcomes, however I do think that the some issues should be clarified in the manuscript before it could be published in the journal.

the importance of frequency and quantity of the FFC, how to measure the quantity of the FFC in their own study.

Response: We used modified food frequency questionnaires (FFQ) to estimate FFC consumption instead of using 24 dietary recalls. There are both pros and cons of using these methods. Given the large sample in our study, we used FFQ which could not provide detailed quantity information. We acknowledged this limitation in the manuscript. More studies with exact measure of quantity of FFC intake and its contribution to children's total energy intake are needed to detect the association between FFC, obesity and hypertension. (Discussion, Lines 313-318, 322-325, Page 16)

whether in the introduction and and in the discussion section, the authors should mentioned more the difference of western and Chinese FFC in their components(nutrients) and their single and co-association in the development of the Obesity, hypertension, and other health-related outcomes. Try to clear their contribution to the increased caloric intake and health-related risk.

Response: Thanks for the comments. We have added relevant discussion in the manuscript. "In this study, we defined Western FF as food sold in these fast food chains, e.g. KFC, McDonald's, Pizza Hut, and defined food from non-westernized style quick service vendors, including food stalls, as Chinese FF. There may be some non-fried food (e.g., steamed buns and noodle soup) sold in food stalls. This would make our estimate more conservative. However, the components, nutrients and health consequences of Western and Chinese FF may be different. More studies are needed to identify the differences between Western and Chinese FFC and their single and co-association with obesity, hypertension and other health-related outcomes". (Discussion, Lines 299-305, Page 15)