Author's response to reviews

Title: The prevalence and correlates of behavioral risk factors for cardiovascular health among Southern Brazil adolescents: A cross-sectional study

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Author's response to reviews: see over
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Author’s response to reviewers: see over
Dear Editors of *BMC Pediatrics*,

We thank you for the evaluation of the manuscript entitled "The prevalence and correlates of behavioral risk factors for cardiovascular health among Southern Brazil adolescents: a cross-sectional study". MS: 7798042956837048.

The comments of the reviewers contributed substantially to the improvement of this version of the manuscript. Changes are hatched in the new version of the manuscript, in blue.

We hope this new version of the paper can meet the high standard of the journal and we are looking forward to your positive response.

Below are the author’s comments according to the reviewer suggestion.

Best Regards,

The Authors

### REFEREE 1

**Reviewer: Juan Miguel Fernández-Alvira**

**Overall Comments**

1. **Abstract:** Results section needs to be rephrased. I suggest to move the “approximately 30% of the adolescents reported three or more…” sentence to the top of the section, before the description of the high risk groups. Conclusions section: I think the presented conclusion is not answering the main objective of the analysis, which is to examine the prevalence and correlates of the BRBCH. I suggest to stress the high prevalence of risk factors and the simultaneous presence in a third of the sample.  

**AUTHOR’S COMMENT:** Changes in the abstract were taken to meet this reviewer’s suggestion, both in the results section and in the conclusion subsection (page 2 and 3).

2. **Methods:** in the second paragraph of the sampling procedures section, it is not clear whether all the contacted schools participated in the study. There were no refusals? Written permission of the school directors was needed? In the third paragraph of the Sampling procedures section, it is not clear whether all children receiving an invitation to participate in the study actually participated. From the text it seems that 100% of contacted children accepted to participate. Is this the case? In any case, it should be stated.  

**AUTHOR’S COMMENT:** We agree with the reviewer that the information on refusals and losses is an important part of the manuscript. Therefore, a sentence was added in the *Sampling Procedures* section (page 6, 2nd paragraph). On cases of losses and refusals during the sampling data collection, it is important that the cluster sample selection procedure generated a sample of 1,812 adolescents. All of these adolescents were invited to participate in the study after obtaining written informed consent from parents/guardians. Thus, all adolescents participated in the data collection. A brief explanation on this topic was added to clearly establish this information (page 6, 3rd paragraph).
3. Methods: in the fourth paragraph of the “measures and data collection procedures” section, it is stated that cases with consumptions over 7000 kcal/day or below 500 kcal/day were excluded. The reference 19 doesn’t give support to this criterion. Further, Does this cut-off criterium take into account sex, age or BMI variables? Authors should clearly state the cut-off choice criteria.

**AUTHOR’S COMMENT:** the reviewer is right to indicate that the reference Fonseca et al. (1998) does not support the criterion to exclude FFQ with improbable or impossible fills. Therefore, the reference basis for this criterion was added in the study (new reference 19, Ludwig et al., 2001, hatched in blue). The current reference 18 (Fonseca et al., 1998), was removed this section. Importantly, this cutoff is used in the literature to distinguish the questionnaires with “impossible” estimates (and probable incorrect), and do not necessarily an estimate of the individual-specific energetic consumption. These cutoffs have been used previously to exclude the cases of overestimated energetic consumption (1–3). These references were not added to the manuscript because the number of references is elevated, as well as the new reference 19 have the necessary support for this criterion.

4. Methods: in the “possible correlates of isolated and simultaneous BRFCH” section, it is stated that economic class and the education attainment of the head of the household were assessed. Although the authors include the reference of the questionnaire, it would be of interest to expand a bit on those parameters. In the manuscript, the socio-economic correlates of the risk factors are of paramount importance. It is not clear which variables include the “economic class” (just income?) and who was considered the head of the household (parent working outside? the father? The highest education level in the household?)

**AUTHOR’S COMMENT:** We agree with the reviewer that the manuscript need a greater detail of the correlate variables. Therefore, information was added on the criterion for determining the economic class, head of household’s schooling, and occupational status. Additionally, some information was added to detail the behavioral correlates. This description has been added in the section *Possible correlates of isolated and simultaneous BRFCH* (page 9 and 10).

5. Discussion: in the seventh paragraph the gender differences on the BRFCH are highlighted. These differences are also of paramount importance for prevention. However, the reference 38, used at the last sentence of the paragraph makes reference only to tobacco and alcohol, but not to the rest of the included BRFCH. Other than the concept of identity, other factors such as preferences are also important. Some reference including the rest of the behaviors should be cited.

**AUTHOR’S COMMENT:** We agree that it is important to discuss the variable gender in detail. Therefore, to meet this suggestion, a text was added to discuss other aspects that lead the behavioral differences between genders. References on behavioral factors and gender differences (mainly on insufficiently active and eating habits) were also included. In addition, we discussed the importance of gender in the design of healthy lifestyle interventions in adolescence. The text added in the *Discussion* (page 18, 7th paragraph).

6. Discussion: in the eighth paragraph the impact of economic class on the BRFCH is discussed. However, some references to the findings in other countries are needed, specially for risk factors such as TV viewing and physical activity. It is well known the inverse relationship between economic class and such factors in Europe countries for example, and the direct relationship in other countries. As the relationship between economic class and behavioral risk factors changes depending on the country or region, it should be stated at this stage, in order to clarify the actual situation in the south of Brazil right now.

**AUTHOR’S COMMENT:** The discussion about the association between economic class and BRFCH was expanded. We agree that this discussion will improve our manuscript and allow the reader to identify the Southern Brazil pattern and compared it to other countries (Discussion section, page 18, 8th paragraph). We added a discussion indicating that the direction of the association between economic status and BRFCH may vary according to the behavior assessed. Evidence from studies in Europe, North America and Asia were added to support this idea. Additionally, we emphasize that the direction of this association may change from region to region. Finally, considering the results of this study, we reinforce the practical suggestion on the subgroup of risk (adolescents of high socioeconomic status) to BRFCH.
7. Discussion: as a strength of the study the authors state that the analysis was done in a representative sample of adolescents from public schools in a major Brazilian municipality. The sample was representative of the total municipality or representative of the public schools? Were private schools intended to be included in the study? Which is the % of private schools in the municipality, and further, could this affect the representativeness of the sample?  

AUTHOR’S COMMENT: A brief text was added to reinforce the importance of public schools for the educational system of Curitiba (and Brazil as a whole; see Discussion section, thirteenth paragraph, page 21). This statement was based on 80% of adolescent students are enrolled in public schools, and that the public school system is the main focus of health promotion public policies in Brazil.

8. Conclusions: this part is too long and repeats the results. I suggest to shorten it, and focus just on the main findings (e.g. high prevalence of simultaneous presence of BRFCH and the impact of socio-economic variables on this prevalence) and in the need of tailored healthy lifestyle promotion strategies.  

AUTHOR’S COMMENT: We thank the reviewer for this suggestion, which will improve the interpretation of the manuscript. Detailed information about risk subgroups were removed from the conclusion, and a greater focus was given to the practical application of these findings for health promotion in Brazil.

Minor revisions:
1. Background: in the second paragraph “… characterized by a high vulnerability to environmental factors, such as the media, friends, school and the community.”, please replace “high vulnerability” by “high susceptibility”.

AUTHOR’S COMMENT: the suggested change was performed.

2. Background: in the first sentence of the third paragraph, I suggest to delete “inapropriate”. You could merge this sentence with the second (e.g. “Several behaviors have been linked to cardiovascular diseases, and therefore are considered as behavioral risk factors for cardiovascular health (BRFCH)”)

AUTHOR’S COMMENT: the suggested change was performed.

3. Methods: First sentence should be rephrased carefully in order to make it clear.

AUTHOR’S COMMENT: the suggested change was performed.

4. Discussion: in the first sentence, I suggest to replace “demonstrate” by “show” or “illustrate” or “reflect”.

AUTHOR’S COMMENT: the suggested change was performed.

5. Discussion: the last sentence of the tenth paragraph should be rephrased. It is too long and difficult to understand as it is in the present form.

AUTHOR’S COMMENT: the suggested change was performed.

6. Discussion: in the eleventh paragraph, replace “feeding habits” for “eating habits”

AUTHOR’S COMMENT: the suggested change was performed.

7. Throughout the manuscript, I suggest to replace “soft drink consumption” by “soft drinks consumption”.

AUTHOR’S COMMENT: the suggested change was performed in all sections of the manuscript.

8. Table 2: in the first line, the symbol of % should not be there.

AUTHOR’S COMMENT: the suggested change was performed.
This symbol was removed from Table 2.

Quality of written English: Not suitable for publication unless extensively edited

AUTHOR'S COMMENT: The first version of the manuscript was edited for proper English language, grammar, punctuation, spelling, and overall style by one or more of the highly qualified native English speaking editors at American Journal Experts (certificate verification key: 7951-1BB2-3B24-6156-F0EF). Moreover, this version of the manuscript was also reviewed by all authors to identify possible errors. Finally, the manuscript was also corrected by a professional with over ten years experience in English speaking countries.
**Discretionary Revisions (which are recommendations for improvement but which the author can choose to ignore)**

1. Introduction section should be shortened in order to clearly establish the study question. Additional information such as included at first paragraph could be omitted.

**AUTHOR’S COMMENT:** we make changes to the first and third paragraphs of the Introduction to clearly establish the purpose of the study.

2. Why did the authors use a limit of 300 min per week whether actual physical activity recommendations for children and adolescents are at least 60 min per day 7 days per week (420 min per week)?

**AUTHOR’S COMMENT:** This was one of our main concerns during the data analysis of this manuscript. Initially, we chose to use a cutoff of 300 minutes per week to facilitate data comparison, especially in Brazilian literature (all previous studies with Brazilian adolescents adopted this criterion). Additionally, even studies published after the current WHO physical activity guidelines (60 min per day or 420 minutes per week) also adopted the cutoff point of 300 minutes per week. However, considering that our data collection was conducted in 2011, a period in which the current WHO physical activity guidelines were already in force, we pondered the suggestion of the reviewer and decided to follow the new recommendation. Thus, important changes in the manuscript were performed:

   1) The reference of the current WHO physical activity guidelines was added in the Methods section (Page 7, third paragraph) and in the reference list.
   2) The prevalence of insufficiently active increased to 50.5%. Changes in the abstract, results, discussion and conclusion were made to meet this new evidence. All changes were hatched in the manuscript.
   3) Data on the prevalence of insufficiently active according to the independent variables (Table 1), prevalence ratios for this variable (Table 2) and simultaneous BRFCH (table 3) were adjusted after the new results.
   4) In the Discussion section on the prevalence of insufficiently active (Page 15, second paragraph), the references have been replaced. We used a reference that has adopted the same cutoff point of this study and a questionnaire with similar characteristics (3-day physical activity record).
   5) Only a change in the values of significance of the associations occurred after the new analysis. Economic class lost its association with the prevalence of insufficiently active, after changing the cutoff point (see Table 2).

3. How is the minimum age to work at Brazil? I am a bit surprising with that item.

**AUTHOR’S COMMENT:** In Brazil, the minimum age to start in the labor market is 16 years. However, it is important to note that many Brazilian teens need to start in the labor market before that age, with work activities in a family business (e.g., working in the family trade), or in vocational training during high school. Therefore, several Brazilian studies has defined working as any activity that contributed to the production of goods or services, including unpaid activities, but excluding household chores in the adolescent’s own residence (4–6). This criterion was also adopted in the present study. To clarify this information, a sentence was added in the Methods section (Page 9, 3rd paragraph).

4. Discussion and conclusions are supported by data but in my opinion both sections should be shorted in order to facilitate its comprehension.

**AUTHOR’S COMMENT:** the suggested change was made in the Discussion and Conclusion sections in order to facilitate their comprehension.

**Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)**

1. Sample selection seems appropriated but these paragraphs should be simplified and shorted.
2. In my opinion title is adequate but abstract should be rewritten in order to clearly establish the methodology, the main results and the conclusions of the study.  
**AUTHOR'S COMMENT:** the suggested change was made in the Abstract (page 2).

3. Keywords should be reviewed.  
**AUTHOR'S COMMENT:** the definitions of the Medical Subject Headings (MESH) were read to the choice of descriptors. Changes were made in the descriptors based on these definitions. The descriptors were added in the text hatched in blue (Page 3).

4. Correlates with BRFCH at methods section should be properly explained (e.g. How was the number of physical education classes calculated?).  
**AUTHOR'S COMMENT:** Details of the correlate variables were added in order to meet the suggestions of the reviewers, both in the sociodemographic and behavioral variables. The changes were hatched in blue (pages 9 and 10).

5. As authors indicate at discussion section, I consider the use of self-report methods as a limitation of the study. Then, I would like to know why authors used a questionnaire developed by Bouchard et al. at 1983 (see reference 15) to assess physical activity. Do you know IPAQ?  
**AUTHOR'S COMMENT:** We believe that the use of self-reported instruments for BRFCH assessing has limitations as appear in the discussion. However, we believe that the 3-day physical activity record proposed by Bouchard et al. was a wise choice to physical activity assessment. We thought about it for three reasons. First, the Bouchard’s instrument allows the estimation of moderate and vigorous physical activities (MVPA) from different domains (which should be considered in the physical activity guidelines). Second, the counting values 6-9 (MVPA) was strongly correlated with the ability to work (exercise test; \( r_{\text{intraclass}} = 0.80 \)) (7). Third, this instrument has been used in Brazil as a reference method for validation of physical activity instruments among adolescents (7,8). Therefore, we believe that the use of the Bourchard’s instrument was suitable for our study. We have a comment about using IPAQ to physical activity assessment in this study. IPAQ was validated for the Brazilian adolescents previously (7), and this study found that the IPAQ was not a good instrument for physical activity assessment among adolescents aged 14 years or younger. Since the present study include adolescents in this age years, we decided to choose another instrument.

6. Review the use of abbreviations at text and explain everyone first time appears.  
**AUTHOR'S COMMENT:** a review of the use of abbreviations was performed.

7. Discussion section starts with “The results of this study demonstrate...”.According the limitations of the study I consider more appropiated to use “The results of this study show...”.  
**AUTHOR'S COMMENT:** the suggested change was performed (page 15).

8. Review a missed letter “e” at first paragraph of conclusions section.  
**AUTHOR'S COMMENT:** the suggested change was performed.

3. **Major Compulsory Revisions (which the author must respond to before a decision on publication can be reached)**

1. Did the parents sign the informed written consent?.  
**AUTHOR'S COMMENT:** We redesigned the Ethical Considerations section (page 11) in order to elucidate the details of the ethical procedures adopted in this study. Information was added on written consent from parents/guardian and formal authorization of the school.
REFERENCES


