Author’s response to reviews

Title: Association of caries experience and dental plaque with sociodemographic characteristics in elementary school-aged children: a cross-sectional study

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We thank all the Reviewers for their valuable feedback and taking the time to provide useful comments improve our manuscript entitled “Association of caries experience and dental plaque with sociodemographic characteristics in elementary school-aged children: a cross-sectional study”.

Based on the constructive comments the following changes have been made

Response to Reviewer 1 – Dr Luciane Maria Pillotto:

Comment in the title:

"socio demographic" or "sociodemographic"?

Response: The change advised have been edited and refined.

Comment in the abstract:

1. In the background, although it is possible to identify the propose of the study, it could be specified. Suggestion: "Thus, the proposal of this study..."

Response: Details have been added

2. The bracket is not necessary: 7-8 years [6.53 (SD=4.37)]. Review the use of the bracket in the results section and the tables as well.

Response: The changes advised have all been edited and refined.
3. Please review the interpretation of the result, because girls had dmft smaller than boys: "The chance of developing dental caries (dmft) was 0.475 time higher in girls than in boys (p<0.001)". This same phrase is used in the Results and Discussion section.
Response: The changes advised have all been edited and refined.

4. The authors could standardize the number of decimal places used with the OR, usually 2 decimal places are used.
Response: The changes advised have all been edited and refined

Comment in the Introduction;
1. It would be important for the authors to contextualize the situation in Hamadan province as there are important differences between the regions in Iran.
Response: Thank you for your valuable comment. We have added more information to the background to give a clear view of the situation in Hamadan and logically present our aim of the study. Corrections have been included in the manuscript page 4 line 4-11

2. Correct: dentistry care, - dentistry care
Response: This section has been revised.

3. Correct: entire regions in Iran Besides - entire regions in Iran. Besides
Response: This section has been revised.
Comment in the Methods:

1. The use of dental explorer is not indicated for diagnosis of dental caries. The use of this instrument could overestimate the diagnosis or cause cavitation that could influence the increase of future index. In addition, the use of plaque disclosing tablets to measure plaque may increase the value found. Perhaps these facts influenced the outcome and could be discussed in the paper.

Response: The examiner used ball-ended explorer according to World Health Organization guideline. Dental caries diagnosis included all teeth which had cavitated decay, undermined enamel, softened floor or wall of undermined enamel. In cases where these descriptions could not be verified by visual inspection ball ended-explorer was used. Manuscript method, Dental examinations section, page 6 line 20.

Disclosing tablets stain very thin layers of plaque and might influence amount of plaque scores. However results of this study on plaque numbers were in accordance with the national survey in Hamadan (1). Additionally current evidence is in favor of using disclosing tablets for practical measurement of dental plaque instead of using a scaler. Besides measurement issues the outcomes of using disclosing tablets have shown to be effective in improving hygiene of patients. Corrections have been included in the manuscript discussion, limitation section page 15 line 23.


2. In this section, there is a sentence describing the use of logistic regression and linear regression to investigate association between independent variables and oral health indicators. Please explain how the DMFT/dmft variable was treated in the regression model. Moreover, in my opinion, I would consider the use of plaque presence as an explanatory variable rather than outcome.

Response: Thank you for your kind comment. We treated DMFT/dmft as outcome variable and in a dichotomous way as having caries experience or not having this experience. The explanation has been added to the manuscript method, data analysis section page 7 lines 8-18. Also as one of our research questions in this research project was also to identify the oral hygiene status of school children and investigate its association with different socio-demographic factors we have used plaque presence as an outcome variable.

Comment in the Results:
1. The authors wrote: "The boys had 77.5% primary teeth and 47.08% permanent teeth with caries and the girls had 68.2% primary teeth and 45.9% permanent teeth diagnosed with caries" - DMFT/dmft > 0 (%) does not indicate the percentage of decayed teeth but the percentage of children with caries experience (decayed, missing or filled teeth). Additionally, the numbers reported for dmft are incorrect. In the Discussion section it is also written as percentage of decayed teeth.

Response: Thank you for your valuable comment. The changes advised have all been edited and refined in both results and discussion section and highlighted in yellow.

2. The data mentioned in this sentence are not in Table 1: "The highest dmft was seen in boys aged 7-8 years [7.87 (SD= 4.36)], the highest DMFT in girls aged 12-13 years [1.43 (SD= 2.10)], and the highest dental plaque in boys aged 12-13 years [52.78 (SD= 25.71)] (Table 1)."

Response: Thank you for your valuable comment. We have revised the table and also sentence.

3. In the Methods section, it is written that the inclusion criteria were age range of 7-12 years old, but in the results (see above) and in other parts of the text appears the age group of 12-13 years. Please check ages.

Response: The changes advised have all been edited and refined.

4. Review the use of the world "higher" in the sentence: "The chance of developing dental caries was insignificantly higher in school..."

Response: Thank you for your kind comment. We have revised the sentence.

5. Correct: pain(p<0.05) - pain (p<0.05)

Response: The change advised have been edited and refined.

6. There was no loss of data in any variable?

Response: Thank you for your valuable comment. The clinical examinations and interviews were performed for school children in this study who followed the disciplines of school and the staff and teachers which were rigorous specially on health related issues. In addition questionnaires
for all selected students were able to be completed by perseverance of the researcher after two follow-ups. So there were no missing data in this study. Corrections have been included in the manuscript method page 6 lines 2-5.

Comment in the Discussion:

1. This study is important because it provides information on oral health in children aged 7-12 years of Hamadan, but the generalization of the findings may be compromised since the schools were selected by convenience sampling. Authors need to be cautious in their assertion.

Response: The sentence is reworded: Accordingly, seven schools were selected from district 1 and nine schools from district 2 by simple random sampling. The explanation has been added to the manuscript method. Page 5 line 19.

2. Correct: Hamdan- Hamadan

Response: The change advised have been edited and refined

3. I'm sorry but I'm confused by the interpretation of the authors in this sentence: "According to current study, dmft has increased by 1.15 times in children aged 7-8 years and DMFT increased by 0.60 time in children aged 12-13 years in Hamadan compared to the corresponding figures in national survey in 2012-2013." In my understanding, DMFT decreased in this period.

Response: Thank you for your kind comment. You are right we have reworded the sentence to provide clear meaning. The explanation has been added to the manuscript. Page 10 lines 1-3.

4. In this section, the authors emphasize that high caries rates are due to inadequate oral hygiene habits or lack of knowledge. Currently, there is a wide discussion about the influence of social determinants on oral health. It would be interesting for the authors to address this issue

Response: We have emphasized in the discussion that huge costs of dentistry care, inequality in delivering dental services in the public oral health care system, lack of information and knowledge on oral health such as social determinants contribute to high caries experience. Page 10 lines 23-25 ang page 11 lines 1-6. Also additional information regarding social determinants on oral health has been added to the manuscript. Page 10 lines 8-10.
5. Water fluoridation influences the caries index and the authors do not mention this fact in this section. Reference 4 may help with this. Furthermore, in this study the variables father/mother's education-father/mother occupation and parent supervision were not significant.

Response: As you have kindly pointed out, studies have shown the role of adequate fluoride concentration in drinking water on probable reduction of dental caries prevalence (% with dmft/DMFT > 0) by 15% and in absolute terms by 2.2 dmft/DMFT (23). Furthermore in Iran various studies have shown that fluoride concentration in Iranian population drinking water is lower than the standard level however there are no community water fluoridation interventions going on in Iran at the moment. We have added this information to the manuscript. Page 10 lines 10-15.

Similar to previous studies (1-6) in the present study, we observed that children whose parents had a better socioeconomic status (academic educations and governmental occupations) and were more supervised about their children's oral hygiene had a higher proportion of filled teeth and a lower proportion of decayed teeth. Compared to those of other children, Similar to previous studies (Table 2). This issue resulted in a higher caries experience (dmft and DMFT) in this group of children. Accordingly, it can be postulated that similarity between the experience of dental caries in children and socioeconomic status of their families resulted in a non-significant relationship between oral hygiene in children and socioeconomic status of their families (7).


6. The meaning of the last paragraph in Discussion section is not clear to me. Please explain what the relation of study design limitation is if the demographic characteristics did not show any association between parental socioeconomic characteristics.

Response: Thank you for your valuable comment. We have included some factors that might explain the current results. They might be possibility of receiving socially acceptable responses by parents and indirect effect of socio economic situation of families on the children's oral hygiene status that were not studied in this research project. Corrections have been included in the manuscript page 15 lines 6-12 and page 16 lines 17-22.

7. In the discussion, the authors reinforce some preventive strategies that seem to be repeated within this section and at the conclusion. Some results are also repeated here. Please review the last paragraphs and the conclusion.

Response: Thank you for your valuable comment. You are right we have revised the discussion and conclusion and revisions are highlighted in yellow. Page 9 lines 16-22.

8. Correct in reference 4: iran – Iran

Response: The change advised have been edited and refined
Response to Reviewer 2 – Alexandre Baumgarten

Comment in the title:

1. The title of this manuscript refers to ‘dental caries’. However, the authors used the DMF index, which is well established as a measure of caries experience in dental epidemiology.

Response: Thank you for your kind comment. The change advised have been edited and refined.

Comment in the abstract:

1. Background: The objective needs to be clearly stated and defined. It is unclear how the authors will "help plan for oral health promotion and oral disease prevention."

Response: Thank you for your kind comment. We have revised the objective accordingly.

2. Results: The presentation of this section needs to be standardized.

Response: The changes advised have all been edited and refined.

3. Conclusion: The conclusion does not essentially correspond to the objective of this manuscript.

Response: The changes advised have all been edited and refined.

4. Key words: Justify the choice for 'dental health'.

Response: Thank you for your useful comment. We changed “dental health” to caries experience and added dmft/DMFT.

Comment in the Introduction;

1. It is necessary to revise and improve the background section, including the objective, in order to create conditions to sustain the exploration of the factors investigated. The section presents subjective aspects, which are not covered at the paper.

Response: Thank you for your valuable comment. We have inserted changes in the background in order to highlight the importance of assessing caries experience among this specific age group and the intended outcomes.
2. About the sentence: 'Meanwhile, children aged 6-12 years old represent a top priority in oral health programs'. Not clear to me. I suggest further develop this paragraph, explaining in which oral health programs. Is it for Iranian public health or a specific program?

Response: This is because “Oral Health office in the Ministry of Health and medical science in Iran” has started implementing a Program entitled “National oral health promotion program for primary school students” from 2016. Therefore detailed and up-to-date information on the oral health of this age group from our study could be helpful for the accurate implementation of the program. Corrections have been included in the manuscript page 3 lines 4-13.

3. In the third paragraph the authors already describe known factors for the increase of the dental caries in Iranian children. Why they were not presented and evaluated concomitantly in the statistical model? The presentation of such data could justify paragraphs in the discussion and background.

Response: Thank you for your valuable comment. This study is part of a greater project which we will study some of the variables mentioned in the introduction such as oral health-related behaviors, children's and families' knowledge levels on oral health in second step. This is because of limitation in resources and time. Therefore we mentioned in the discussion related variables that have not been measured in this study as a limitation. Corrections have been included in the manuscript page 15 lines 6-12.

4. Page 4 - First paragraph

This paragraph is confused. If the prevalence of dental caries is 81.83% and 86.89%; why a small number of children need treatment? I suggest further develop and clarify.

Response: Thank you for your kind comment. We have revised and added more information to this paragraph to give a clear vision of the current situation. However in the oral health surveys conducted in Iran the definition used for dental caries is based on World Health Organization (WHO) diagnostic criteria. As initial lesions have not been counted as needing dental treatment so this underestimation is generally seen in epidemiological studies (1,2). Page 3 Lines 25 and page 4 lines 1-3.


5. Page 4 - Second paragraph:

The study does not support this paragraph. It still presents review errors and requires references. The first part of the paragraph is confused and has no connection with this study. There are descriptions of access barriers, however this paper did not investigate them. The authors do not mention whether they are barriers of public or private system. The objective needs to be clearly stated and defined.

Response: Thank you for your valuable comment. Inappropriate content was deleted. The objective has been modified.

Comment in the Methods:

1. Seems to be appropriate for this study, but some extra information is required. The sample size calculation was performed? Without the description of the variables, it is impossible to evaluate specific questions in results section. So, for each variable, give sources of data and details. Clearly define the outcomes and describe any efforts to address potential sources of bias. It is not clear how missing data were addressed.

Response: Thank you for your valuable comment. Additional information regarding sample size calculation has been added. Corrections have been included in the manuscript page 5 lines 4-9 and lines 22-24.

For each variable, sources of data and details have been explained in the manuscript page 6 lines 6-15.

The outcomes have been explained in the manuscript page 7 lines 8-18.

Regarding sources of error in this study, the non-response rate was included in the sample size estimation and more students were selected. The clinical examinations and interviews were performed for school children in this study who followed the disciplines of school and the staff and teachers which were rigorous specially on health related issues. In addition questionnaires for all selected students were able to be completed by perseverance of the researcher after two follow-ups. So there were no missing data in this study. The more rigorous data collection and two follow-ups by the researcher were incorporated to prevent missing data. Corrections have been included in the manuscript page 6 lines 2-5.
2. If the authors performed a "cluster multistage sampling", why "seven schools were selected from district 1 and nine schools from district 2 by convenience sampling"? All had an equal chance of being selected?

Response: Thank you for your kind comment. The numbers of final schools selected were proportionate to the total number of schools in each district as illustrated in the diagram. We have reworded the sentence is: Accordingly, seven schools were selected from district 1 and nine schools from district 2 by simple random sampling. Page 5 Line 19.

3. Figure 1: The title is inappropriate. The figure presents formatting errors and missing data. The lower text boxes are confusing and difficult to understand.

Response: The changes advised have all been edited and refined

4. Page 5 - Lines 36-41

More details are needed about the questionnaire applied.

Response: Thank you for your valuable comment. Additional information regarding questionnaire has been added in the manuscript page 6 lines 6-15.

5. Dental examinations section: It was not clear whether one or several students conducted the exams. Was calibration performed? Reference 14 shows an error.

Response: The examinations were conducted by a dental student at the last year of general dentistry program. He was trained by the community oral health department faculty of Hamadan dental school. Reference 14 has been modified.

6. O'Leary index was performed (as indicated in abstract), but it is not presented in this section.

Response: The changes advised have all been edited and refined in the manuscript page 6 lines 24-25.
Comment in the Results:

1. No information about participants was presented. Report the numbers of potentially eligible students, missing data, refusals and motives. A division of the DMF index in this section would qualify the study.

Response: Thank you for your valuable comment. The clinical examinations and interviews were performed for school children in this study who followed the disciplines of school and the staff and teachers which were rigorous specially on health related issues. In addition questionnaires for all selected students were able to be completed by perseverance of the researcher after two follow-ups. So there were no missing data in this study Corrections have been included in the manuscript page 6 lines 2-5.

Additional information regarding DMF index has been added in table2.

Table 1: The title is inappropriate. The table needs to be standardized and formatted. The same age is in two categories (Example: 7-8; 8-9 years). Present values with the same number of decimal places in all its cells (standardization). What means >0 in the cell >0(%)?

Response: Thank you for your valuable comment. Details have been added and the changes advised have all been inserted.

Table 2: The title is inappropriate. The regression was adjusted for which variables? Table 2 was not cited in the second paragraph of page 7.

Response: Details have been added and the changes advised have all been edited and refined. The regression was adjusted for age and sex. Corrections have been included in the manuscript page 7 line 17.

Table 3: The regression was adjusted for which variables?

Response: The regression was adjusted for age and sex. Corrections have been included in the manuscript page 7 line 17.
Comment in the Discussion:

The discussion presents, in several occasions, restatement of results, which is not necessary. There are numerous comparisons with other studies, but without theoretical depth. The authors discuss topics and make statements on items not investigated by this research. Although the authors indicate an increase in dental caries, which cannot be confirmed with this cross-sectional study, no new associated factor, in addition to those already discussed deeply in the literature has been presented.

Thank you for your valuable comment. We have made a considerable amount of revision to the discussion part of the manuscript according to your helpful comments.

Page 7 - Fourth paragraph:

This part can be discussed in limitation paragraph: "To the best of our knowledge, the current study is first to provide [...] be considered the strengths of the present study". The second part of this paragraph is reaffirmation of results and can be suppressed. I suggest that the authors present key results with reference to study objectives.

Response: Thank you for your valuable comment. The strengths of the present study have been added in the manuscript page 15 lines 13-20.

The changes advised about key results have all been edited and refined in the manuscript page 9 lines 16-22.

Page 8 - First paragraph:

There is no reference for "A national oral health survey in Iran was conducted in 2012-2013 that demonstrated the mean dmft of children aged 7-8 years was 4.94 nationally and 5.64 in Hamdan.

There is lack of information in references 16 and 17

Response: Reference to a document describing this information in detail has been added. Page 9 Line 24.
The results that the authors exposed were not presented in the results section.

Response: Thank you for your valuable comment. According to Table 2 corrections have been included in the manuscript page 11 lines 14-25.

The authors make statements that cannot be answered with this research.

Response: Thank you for your valuable comment. According to Table 2 corrections have been included in the manuscript page 11 lines 15-25.

Again the authors make statements that cannot be answered with this research.

Response: Thank you for your valuable comment. In this study we have tried to emphasize the role of preventive approach or actions in the field of oral health. So although some variables have not been actually measured in present study but they have been mentioned to give a realistic and systematic view of the general oral health conditions in Iran. Furthermore office of oral health has taken large steps to fund preventive dental care for school children under 12 year olds. These two categories together highlight the role and necessity of preventive actions on oral health and accurate measurements in Iran and specifically in the city of Hamadan. Furthermore according to Table 2 corrections have been included in the manuscript page 10 lines 23-25 and page 11 lines 1-8.

Reference 35 does not apply to the paragraph. Again the authors make statements that cannot be answered with this research.

Response: Thank you for your valuable comment. Reference 35 was deleted. According to Table 2 corrections have been included in the manuscript page 13 lines 14-25 and page 14 lines 1-4.
The statement 'Meanwhile, schools may be the best place to deliver training on oral health to children, because about one billion children worldwide spend greatest and effective part of their day in schools...' is not depth discussed.

Response: Thank you for your kind comment. Schools provide an appropriate setting for children’s health promotion by offering an educational environment for improving health through increasing self-esteem, health literacy, self-efficacy and sense of control over their lives. The positive messages and practical interventions can be reinforced throughout the consequent years which children are studying in the school. Some believe schools are more influential than families because of positive exposure to teacher support and peer networks. Corrections have been included in the manuscript page 12 lines 14-20.

Page 10 - Third paragraph

Dental plaque was only associated with age, however it is discussed that 'the present study demonstrated that age, gender, and dental pain in the past year were derived predictors'. A paragraph discussing the difference between the results for dental plaque and caries would qualify the study, as well the following sentence: 'In addition, being female was found to increase the chance of DMFT and dmft by 1.703 times and 0.475 times, respectively.'

Response: Thank you for your valuable comment. The changes advised have all been edited and refined in the manuscript page 13 lines 1-5.

Page 11 - Second paragraph

The paragraph contradicts the results, since education is not associated for your study. I suggest suppressing.

Response: Thank you for your valuable comment. According to Table 2 corrections have been included in the manuscript page 14 lines 10-25 and page 15 lines 1-12.

Page 11 - Third paragraph

Indicating only the design of the study as limitation, evidence the poor development of this paragraph.

Response: Thank you for your valuable comment. Additional information regarding study limitation has been added in the manuscript page 15 lines 21-24 and page 16 lines 1-22.
Conclusion:

The conclusions should clearly answer the objectives.

Response: the changes advised have all been edited and refined