Author’s response to reviews

Title: Salivary characteristics and dental caries experience in remote Indigenous children in Australia: A cross-sectional study.

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Author’s response to reviews:

Editor comments:
Responses:
In regards to the reviewers comments below, we feel the study is relevant for BMC Oral Health in its current form. Thank you.

Please provide all author's emails on the title page. All author e-mails are now included on title page.

Please include a list of abbreviations after the conclusion. Abbreviations are now included.

The following declarations are missing (please see the following link for more details on what should be included - https://bmcoralhealth.biomedcentral.com/submission-guidelines/preparing-your-
- Ethics Approval and Consent to Participate
- Consent to Publish
- Availability of Data
- Competing Interests (this declaration is mentioned but should be moved to the correct section, after the abbreviations and renamed)
- Funding (This should be moved from the acknowledgements sections into it's own subheading).

The role of the funding body in the design of the study and collection, analysis, and interpretation of data and in writing the manuscript should be declared. - if the funding body played no such role this should also be stated. All declarations have now been included, and in the correct locations in the submission.

Author contributions

According to ICMJE guidelines, a to qualify as an author one should have:

- made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; AND
- been involved in drafting the manuscript or revising it critically for important intellectual content; AND
- given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content; AND
- agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

According to these criteria we believe JK, OT, RB, DG, SK, EC and JR do not qualify as authors since they did not contribute to the drafting of the manuscript OR revising it for intellectual content. Please kindly clarify whether MC and WA contributed to other relevant aspects of the study and manuscript preparation. All authors listed have contributed to the content of the submission.

This comment appears to apply to a different manuscript, as authors MC and WA are not known to us.

Reviewer 1:
Responses:
The abstract Conclusions do not fit with the aim of the study and with the study design. The conclusion has been edited to fit the aim of the study and design.

“Childhood salivary counts of MS and LB were significantly associated with greater caries experience in this remote Indigenous community. To address the burden of childhood dental caries it will be important to find ways to reduce the counts of MS and LB in the mouth, whilst continuing to emphasise the importance of tooth brushing with a fluoridated toothpaste and promoting good dietary habits.”

A flow chart of the study design needs to be included.

We have included a flow chart of the study design.
Poor data on the demographic characteristics of the enrolled populations are provided. We have provided details of the demographic characteristics in the 2nd paragraph of the results section.

“The mean age of the children was 8.79 (SD: 3.45), there were more females (55.4%) than males.” Caries data might to be included (total prevalence, DMFS/dmfs and severity). We have now included additional caries data in the results section.

“The mean cumulative decayed (DS+ds), missing (MS+ms) and filled (FS+fs) surfaces were 3.64 (SD: 4.97), 1.08 (4.38) and 0.79 (1.84) respectively. The overall caries experience (d+D) was 5.45 (SD: 7.89). More than three-quarters of children (76.5%) had caries in either of the dentitions (d+D>0).”

Calibration of the examiners is poorly described and no data on reliability intra and inter examiners are provided.

This is now detailed in the methods section.

“All examiners completed the ICDAS-II online training module prior to the community visit. To assess inter-examiner reliability, agreement was tested using Kappa statistics. Approximately 5% of children were examined by the three examiners; and discrepancies in scores were discussed with the child present. The overall Kappa was 0.837, indicating a high level of agreement between the examiners.”

The methods used to evaluate hydration and consistency of saliva need to be supported by references. We have removed these two salivary variables as almost all children had normal hydration and a significant majority had watery saliva.

How were yeasts measured? This detail is included in the Methods section.

“These commercial kits use selective media for MS and LB: these media also support the growth of oral fungi, detectable by their large colony size.”

“Yeast counts were categorised into none/light and moderate/heavy. “

No information regarding the questionnaire are provided. We have inserted the following in the Methods section:

“The questionnaire comprised questions related to demographic information (gender and age) and oral health behaviours (tooth brushing frequency and soft drink consumption). In this analysis information used from the questionnaire related to tooth brushing frequency and consumption of soft drinks (high sugar carbonated drinks) on a typical day. Specifically, children were asked the frequency of daily tooth brushing; categorised into ‘Once or less’ and ‘Twice or more’ for this analysis. They were asked if they consumed a soft drink on a typical day (Yes or No).”

The protocol for the main study is referenced, to avoid duplicating the methods in this paper. The paper's discussion is interesting but does not discuss the given findings.

The discussion has been edited to reflect issues related to the given findings. References are not reported in the style requested by the journal. This has been updated to match the current style of the journal.

The referencing style has changed since our initial submission.
Reviewer 2:
Responses: The authors need to edit the manuscript to address grammar issues (wrong use of capital letters for example: Globe and Indigenous) and paragraph structure.
STROBE guidelines for cross-sectional ? studies should be used. This manuscript has been updated to correct grammatical and reporting guidelines.
The study design should be stated in the title.
Done.
In the background section (abstract) and introduction the "low human development index" statement should be clarified. According to the United Nation Development Programme's Human Development Report, Australia has a very high human development. If should be stated as: Although Australia has a high human development index, the indigenous population human development index is low (please include a reference in the Introduction section).
We have edited this statement in the abstract, and deleted reference to the human development index.
Methods: The authors should summarize the purpose and methods of the main study. Were all the children in the main study caries active? if this is the case, was their saliva collected/analyzed; how this salivary data compare to that of caries active children? Consider using a procedure flow-chart.
This additional information is now provided in the methods section.
“`The overarching aim of the study is to assess the effectiveness, cost-effectiveness and cost-benefit of a single annual professional intervention for the prevention of childhood dental caries in a remote rural Indigenous community.”`
We have included a flow chart, which was also suggested by Reviewer 1.
The protocol for the main study is referenced, to avoid duplicating the methods in this paper.
Results: In this section, interpretation should be avoided (Interpretation should be in the Discussion Section).
Interpretations of findings in the result section have been deleted or moved to the discussion section.
Discussion: Most of the discussion is not pertinent to the results. How your results compare to other studies in the literature? What are the strengths and limitations? The discussion is too long. The paragraphs regarding brushing, fluoride, and diet should be summarized. Are there studies in the literature regarding the effect of brushing, F, and diet on salivary parameters? How they compare to your results?
The discussion has been substantially edited in the response to this and various other comments.
Conclusion: It is too long. (lines 17-28 should be part of the Discussion section). The conclusion has been shortened and lines 17-28 moved to the Discussion; however edited to fit with other changes.
Tables: Contain errors. Table 2 page 20 (the 6th column should be permanent dentition instead of deciduous). It is unclear what is the meaning of (1), (2), (3), (4), in the Mutans streptococci and Lactobacilli (page 23); need a footnote.
The tables are different due to the new analyses conducted.
Reviewer 3:

Reponses:
1. Abstract
   a. The authors should indicate in the Methods part, how many children were involved in the study, as well as their age range;
   b. In the Methods part, the authors state that they used ICDAS, and then in the Results they indicate they used "caries severity scores", these scores should be related also in the Methods;
   c. The last 5 lines of the abstract is more of a discussion than a conclusion. The authors should concentrate their conclusion based on their results; a. The number of children involved and age range are now included.

   “All children (nominally ~600) enrolled at the two primary and one secondary schools in the community were invited to participate. These children are between 4 and 17 years of age, and almost all are Aboriginal or Torres Strait Islander people (Indigenous). Of the about 600 children, 435 participated in the clinical examination phase of the study and 292 provided a saliva sample and completed the questionnaire (Figure 1).”

   “The mean age of the children was 8.79 (SD: 3.45), there were more females (55.4%) than males.”

   b. This has been deleted to reflect new analysis conducted.

   c. This part of the abstract has been edited to focus on the findings of the study.

2. Page 4, Line 44, please correct to "a recent comprehensive review (19)"; Corrected.

3. Methods
   a. The authors state that all children (around 600-650) were invited to participate in the study, but only +-400 underwent clinical examination. Why only +-300 were included in the results? Also, the authors need to discuss the low(ish) response rate of only 60%;
   b. Page 6, line 28: "assessed by three trained and calibrated examiners". Please describe how the training was made, and how the calibration was carried out, reporting the kappa scores;
   c. The authors included children from 4 to 17 yo. How was saliva collection (page 7 lines 6-9) controlled by the 4 yo? Did they strictly follow this protocol?
   d. Page 7, lines 37-39: The authors should clarify the information of how they considered the "caries-free" children. Children who have "no untreated decay surfaces" could already have restorations. These children already had caries experience, and, although not caries active, they cannot be considered "caries-free". Also, what is the advantage of analyzing the "caries-free"
children in these two separate groups? This should be further discussed. a. The response rate is now discussed as a limitation in the discussion.

“…”

b. Details of the calibration of examiners is now included in the methods section.

“All examiners completed the ICDAS-II online training module prior to the community visit. To assess inter-examiner reliability, agreement was tested using Kappa statistics. Approximately 5% of children were examined by the three examiners; and discrepancies in scores were discussed with the child present. The overall Kappa was 0.837, indicating a high level of agreement between the examiners.”

c. Yes. We had no problem in getting the younger children to spit into a collection cup.

d. Clear definitions of “caries free” is now provided; and not separated into two groups.

Caries experience is however now the main outcome of the analysis.

“For this analysis caries experience was defined as the sum of tooth surfaces with an ICDAS-II caries code of 4 to 6 (decayed), plus missing and filled surfaces in both the deciduous and permanent dentitions (whole mouth): dmfs+DMFS. A child was considered to experience caries if he/she had at least a decayed, missing or filled surface in the mouth: dmfs+DMFS>0.”

4. Statistics

a. The authors state that they used several chi-squared tests to associate the different variables with caries scores/severity. The statistical results are not obvious in the tables. The authors should include some p-values. Furthermore, instead of individually analyzing the variables with Chi-squared tests, the authors should have carried out a multivariate regression, including the different factors associated with caries, thus building a multivariate model with the most significant variables that explain the outcome. In such an analysis, some confounding variables could be identified and only the most significant variables remain associated with the caries in this population.

   a. A multivariate model is now presented taking into account other variables.

The entire manuscript has been revised to reflect this change in the statistical analyses.

5. Regarding the new analyses, the authors may need to change the results and discussion sections. In the present results, the authors should change the titles of their tables, explaining in more details what is shown, including the statistical results and p-values. One further comment on the results, the percentage values presented in the second paragraph (page 8, lines 13-19) do match the values from Table 1, a couple of examples follow. The authors should review the results section:
a. (line 13) Instead of 83.9% as stated in the text, the table states 82.8%;

b. (line 15) Instead of 96.9% as stated in the text, the table states 94.6%.
   Due to the new analyses the entire manuscript has been revised; and errors between the text and tables have been checked.

6. Discussion: The discussion seem to be too general. The authors should review the discussion, and focus on interpreting the results of the study. Also the conclusion is too general. The vast majority of what is written as conclusion is rather a discussion. The authors should focus their conclusion based on their findings. The Discussion and Conclusion sections have been substantially edited in the response to this and other comments.