Author's response to reviews

Title: Socio-behavioural factors and early childhood caries: A cross-sectional study of preschool children in central Trinidad:

Authors:

Rahul S Naidu (rsnaidu937@gmail.com)  
J Nunn (june.nunn@dental.tcd.ie)  
Alan Kelly (AKELLY@tcd.ie)

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Author's response to reviews: see over
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Dr. Christopher Foote  
Executive Editor  
Biomed Central

Dear Dr. Foote,

**RE: Socio-behavioural factors and early childhood caries; A cross sectional study of preschool children in central Trinidad.**

We have submitted a revised version of the above-mentioned manuscript which includes changes based on the reviewers reports. We are grateful for the advice and suggestions made by both reviewers and have attempted to address all their comments.

As requested by one of the reviewers the revised manuscript also includes a new multivariate regression analysis (Poisson generalized linear mixed model). We have now omitted the logistic regression we reported in our initial submission with regards to the length of the paper but it could be included for insight if required.

The specific responses to the reviewer’s comments are listed below, point-by-point (9 pages), giving page / paragraph / line numbers where changes have been made. For ease of reading these changes are also highlighted in the text of the revised manuscript by use of underlining, which we hope is acceptable.

We believe the revised manuscript is now stronger and more clearly reports the findings of this study.

Sincerely,

Rahul Naidu  
*(Corresponding author)*

Attached (below page 2-9): Response to reviewers 1 & 2
RESPONSE TO REVIEWERS

REVIEWER 1

1/ Is the question posed by the authors well defined. The authors appear not to use any conceptual model to guide their hypothesis.

Although we cite previous research that describes risk factors for ECC we accept that we did not explicitly include a conceptual model defining the relationship between these risk factors and oral health outcomes.

In the revised paper we now refer to the Fisher-Owens model describing multilevel influences on childhood oral health is now made in the introduction (Pages 3, paragraph 1, lines 16-21) and related to the aim (page 5, paragraph 2, lines 3-6).

2/ Are the methods appropriate and well described

The authors do not account for the (a) urban/ rural character of the 9 preschools (b) clustering of observations within the preschool

(a) The Caroni region includes urban and rural communities. Preschool in the Caroni region are generally situated in urban centres. Children attending these preschools would however be from across the Caroni education district catchment area which includes children living in rural home addresses.

This statement is now included in the Method (Page 5, paragraph 3, lines 1-9 and lines 7-10).

(b) Clustering of observations is now accounted for in the new multivariate analysis – Poisson generalized linear mixed model (GLMM) for counts of dmft). Described in the method (page 8 paragraph 2) and reported in Table 4.

Logistic regression was used instead of a more appropriate log binomial regression that would derive prevalence ratios.

We have replaced the Logistic regression with the Poisson generalized linear mixed model (GLMM)

The nature of the dmft data would ask for a more appropriate analytic approach compared to the non-parametric Wilcoxon and Kruskal-Wallis.

By convention the mean dmft value can be considered to represent severity of caries experience. We therefore report this variable to enable comparison of our findings to similar studies around the world.
As mean dmft was considered a continuous variable, due to the level of skewness, tests appropriate for non-parametric data were used.

The scarcity of the data and the analytical strategy based on the hypothesis testing failed to recognise important associations that did not reach statistical significance but have large effect estimates (e.g. parental occupation and education level).

These two variables have had categories regrouped and reanalysed in Table 1

Occupation of head of household

Education level
  Tertiary v Secondary and below

The model building approach that the authors use does not consider the nature and contextual significance of the variables that are entered in the analysis. Results in paradoxes such as theoretical antecedents, concurrent and downstream events.

The final regression model (table 4) includes factors that indicate multilevel influences relating to child and family level determinants and oral health behaviours, consistent with the literature.

The inclusion of paradoxes in the final model is now discussed in the revised manuscript in the section limitations of the study (Page 14, paragraph 4.)

3/ Are the data sound?

Kappa for the dmft index was 0.9 and this now reported in the Results section.

4/ Does the data manuscript adhere to the relevant standards of reporting and data deposition?
  Yes

5/ Are the discussion and conclusions well balanced and adequately supported by the data? The manuscript will require a reframing considering the limited potential of these data for inference.

The title and aims of the study have been amended to reflect that the data may not be representative of Trinidad as a whole. These specific limitations are now reported and discussed in more detail in Limitations of the study (Page 14, paragraph 2).
6/ Are the limitations of the work clearly stated? The major limitations regarding the sample characteristics (selection and size) and analytical methods are recognized in the discussion.

The section ‘Limitations of the study’ has been expanded in the revised manuscript to include a discussion of the issues of sample selection and study design (Page 14, paragraph 2 and 3).

7/ Do the authors clearly acknowledge any work upon which they are building.
Yes

8/ Do the title and abstract convey what has been found?
The title and abstract would better represent the study if they reflected the exact sample characteristics without making interpretational inferences in the entire Trinidad.

The Title and Abstract have been revised to reflect the sample characteristics.

REVIEWER 2

1/ The English language can be improved.

We have edited the paper with respect to English language.

2/ Is Caroni education district representative for Trinidad? if not the title should be rephrased and should be discussed in the discussion.

We have amended the title to more accurately describe the sample characteristics and data reported in the paper.
The socio-demographics of the Caroni region are now described in the method (Page 5, paragraph 3) and in relation to limitations of the study (page 14, paragraph 2).

3/The discussion is far too long.

We have removed several paragraphs and sections at the beginning of the discussion to reduce its length.
4/Why are the results of the dental behaviour discussed in this paper. What is the relationship with the title of the manuscript?

Previous studies on ECC cited in this paper refer to parental oral health behaviours as a risk factor for ECC. Parental attitudes and oral health behaviours are therefore considered in this context in particular toothbrushing behaviours, fluoride use, dietary choices and dental attendance.

In the ‘Background’ section of revised paper we now also include a conceptual models of oral health in early childhood Fisher-Owens et al who multilevel influences on early childhood oral health (Pages 3, paragraph 1, lines 16-21).

5/ Please define at what level caries experience was assessed (abstract & text).

Caries experience was assessed at the level of the tooth as a summary score. Untreated decay was recorded at D3 (caries into dentine). This is mentioned in the text (page 7, paragraph 1, line 7) and Abstract (line 10).

6/ The authors state that caries experience was not normally distributed – still they calculate the mean of that variable. What is the sense in doing that? The authors should rather present proportion of children with caries experience.

We report the mean dmft values in Table 1 as an indication of severity of caries experience to enable comparison with other similar international studies on ECC, where mean dmft is commonly reported.

7/ The first sentence of the results section should be re-written.

This sentence has been rewritten as: ‘Nine preschools took part in the study.’

8/ It is not clear in the abstract whether the results of the simple or multivariate analyses are presented.

In the Abstract of the revised manuscript we report results for the Poisson regression analysis (Abstract line 18 and 21).

9/ For inclusion in the sampling frame very small schools (<15) and very large schools >60 were excluded. Why was this done?

This was done to include preschools of similar sizes in the sample and facilitate data collection by a single examiner. This statement is included page 6, paragraph 1
10/ The only stratification factor for selecting schools was government assisted.

Preschools in the Caroni education district list are only listed as government or privately run along with enrolment size. No other information was available.

11/ What about families where more than one child went to the same school? were they selected for participation? What about clustering of data.

A family could have had more than one child in the preschool and they would have been included in the study. Clustering of observations is now accounted for in the new multivariate analysis – Poisson generalized linear mixed model (GLMM) for counts of dmft). Described in the Method (page 8 paragraph 2), Results page 11 and reported in Table 4.

12/ “The following variables were selected for inclusion in this study” please rephrase

In the revised paper this has been changed to: ‘The following variables were included in this study’ (page 6, paragraph 3, line 1).

13/ No dietary habits, oral hygiene or dental attendance was collected nor evaluated?

These variables were included in the study and reported in table 2 (dental attendance) and Table 3 (tooth-brushing and fluoride use, feeding and dietary habits)

14/ Oral exams were performed without a mouth mirror?

Disposable mouth mirrors were used for the oral exam (described under examination protocol (Page 7, paragraph 2, lines 7-9).

15/ How can one build a predictive model for ECC based on a cross-sectional study

This point has been now stated in the limitations of the study page 14.

- What is meant by “95% confidence interval for main outcome variables”

This has been changed to ‘Means and standard deviations were calculated for continuous variables and 95% confidence intervals for categorical variables’. Page 7, paragraph 3, line 1)
• dmft should be replaced with visible caries experience.

‘Visible caries experience’ has been added to the text and the results Tables.

• Adjusted should be added to OR.

The Logistic regression has been replaced with a Poisson model in the revised manuscript (Table 4)

16/ Was the Kappa statistic calculated at tooth, child or tooth site level.

Kappa was calculated at tooth level.

17/ ‘severe early childhood caries’ should be defined and a reference added.

A definition has now been included in the Abstract (line 16) Background (page 3, paragraph 1, line 4) along with a reference [Reference 2].

18/ You cannot talk about an effect in a cross-sectional study. Also replace ‘predictors of caries experience’.

The word ‘effect’ has been removed from the Title, main text and tables.

19/ I wonder if reference 4 on page 10 is the correct reference.

This statement has been removed.

20/ “Establish a dental home early in a child’s life” Based on what evidence.

We originally cited the American Academy of Peadiatric Dentistry 2003 guidelines.

In the revised paper we now also cite evidence from the US (Lee et al 2006 - ref 27) a recent protocol published in the British Dental Journal (Ramos-Gomez et al 2012 , Reference 28).

The section now reads:

‘Prevention and Management of ECC should, therefore, involve early dental attendance, that is, by 12 months of age, to establish a ‘dental home’ early in a child’s life. The ‘dental home’ can enable anticipatory guidance, caries risk assessment and early intervention for dental problems [26, 27 and 28].’ (Page 13 paragraph 1, lines 1-6).

21/ The results of the regression analysis should discussed.

The results of the Poisson regression are described on page 11, paragraph 1.

In the revised manuscript, reference to the findings of the Poisson regression analysis are made at points in the Discussion:

Page 12, paragraph 3, lines 8-9
Page 13, paragraph 2, lines 3-6
Page 13 , paragraph 3, lines 1-6
22/ “Oral health rating may have some utility in planning of oral health services” do not make too general conclusion.

This statement has been removed

23/ “In a recent systematic review it was concluded that parental oral health behaviour was an intermediary in the development of ECC”. what is the link to the present study.

To link this statement to the findings to the present study, in the revised paper we follow this statement with the new sentence:

‘Consistent with this, the present study found that parent/caregiver oral behaviours such as dental attendance and dietary habits were associated to rate of caries experience’.

(Page 13, paragraph 4, line 4-6 continued – page 14 line 1-2)

24/ Dental health educators should consider the social context of parental oral health behaviour, using more supportive rather than…(idem)

This statement have been removed

25/ Limitations - what other factors may explain the different results of the present study?

In the revised paper we have expanded the section Limitations of the study Page 14, paragraphs 2-4.

26/ Fig 1 can be deleted.

This has been done

27/ Table 1

- replace the mean dmft (caries v caries free)

We report mean dmft values in Table 1 as an indication of ‘severity of caries experience’ to enable comparison with other similar international studies on ECC, where the mean dmft is commonly reported. Caries experience v No caries experience is reported in Tables 2 and 3.
• reevaluate the categories you made – small n in some groups may be responsible for non-significant results.

This has been done and reported Table 1) and in the results (page 9 paragraph 5, lines 1-2 cont page 10, lines 1-2)

28/ Table 2 & 3

• replace ‘effect’

This has been done

• what does * mean

* indicated significant result but has been removed in the revised paper

29/ Table 4

Logistic regression replaced with Poisson generalized linear model with mixed effects. Described in Method page 8 paragraph 2 and Results page 11 paragraph 1.