Reviewer’s report

Title: ASSOCIATION BETWEEN MALOCCLUSION, CARIES AND ORAL HYGIENE IN CHILDREN 6 TO 12 YEARS OLD RESIDENT IN SUB-URBAN NIGERIA

Version: 2 Date: 08 Aug 2019

Reviewer: Reviewer 2

Reviewer's report:

PEER REVIEWER ASSESSMENTS:

OBJECTIVE - Full research articles: is there a clear objective that addresses a testable research question(s) (brief or other article types: is there a clear objective)?
Yes - there is a clear objective

DESIGN - Is the current approach (including controls and analysis protocols) appropriate for the objective?
No - there are major issues

EXECUTION - Are the experiments and analyses performed with technical rigor to allow confidence in the results?
No - there are major issues

STATISTICS - Is the use of statistics in the manuscript appropriate?
No - there are issues with the statistics in the study

INTERPRETATION - Is the current interpretation/discussion of the results reasonable and not overstated?
No - there are major issues

OVERALL MANUSCRIPT POTENTIAL - Is the current version of this work technically sound? If not, can revisions be made to make the work technically sound?
Maybe - with major revisions

PEER REVIEWER COMMENTS:

GENERAL COMMENTS:
Dear editor,
Thank you for the invitation to review the manuscript "Malocclusion, caries and oral hygiene in children 6 to 12 years old resident in sub-urban Nigeria". This is an interesting study about the association between malocclusion traits and caries, gingivitis and oral hygiene. Overall, it was detected that some specific malocclusion parameters may be associated with dental caries and gingivitis. However, some important aspects of the study are highlighted and need to be considerably improved in order to be further considered for publication. Mainly, the manuscript
may benefit of an English editing, as many typos and awkward sentences are present, and the authors are strongly recommended to follow the STROBE guidelines for observation studies. Additionally, the statistical analyses need to be considered improved, as several collected independent variables were not considered in the multivariate analyses.

REQUESTED REVISIONS:

Title
According to STROBE guideline, the study design must be provide in the title.

Abstract

In the Results section, it is not clear what the numbers inside the parentheses mean.

Background

The introduction section is well-written and state the necessary background to understand the study.

Methods

It is not clear how the demographical data, such as sex and age, were assessed.

When the data was collected? This information is not provided in the present study not in the cited articles.

I did not understand the inclusion/exclusion criteria of the present study.

Regarding the Simplified Oral Hygiene Index and Gingival Index, it is not clear how many sites per tooth were considered in both Indexes. Was all also teeth considered?

The cutoff points are also odd. For instance, a mean 0.1 gingival Index may not represent gingivitis at all, and a mean score of 1.0 may be gingivitis in some patients. Reference must be provided to both cutoff points. The sites with score 2 or 3 (presence of gingival bleeding) may represent a more clinical significance.

In the calibration examiners, how many examiners were involved in the present study?

It is not clear how the sample was selected. In the mentioned references, a different age range is cited, which may not be appropriated for the present secondary analysis. It is recommended to explain the sampling strategy shortly.

In data analysis, it is not clearly demonstrated how logistic regression was used. Was a uni- or multivariate analyses performed? Was collinearity assessed? Please explain in detail.

Why the level of significant was not p<0.05?
It seems that only univariate analysis were performed. Multivariate analyses are strongly recommended in the present study.

Clearly demonstrate if any missing data were present during data analysis. Additionally, clearly state how missing data was handled.

Toothbrush frequency, visit to the dentist and dietary evaluation were not assessed. These variables are strongly correlated if the outcome, and they are not discussed in the present study.

Results

A flowchart is strongly recommended for the present study. Due to the different age ranges reported in the cited studies, the participants inclusion may not be understood by the other cited studies.

In the following sentence: "Participants' DAI scores ranged from 13 to 48 with a mean score of 20.72 (4.57)", clearly state what 4.57 mean.

Please provide the univariate comparison for malocclusion profile and sex.

It would increase readability if most of the descriptive data would be present in a Table, including the comparison between sex of all outcomes.

In Table 2 to 4, what statistical analysis were performed? Clearly state in the Tables. Was logistic regression? If that is not the case, clearly state in the Data analysis section.

I did not understand why, for both multivariate analyses of gingivitis and caries, the Ora Hygiene Index was not included as an independent variable. It seems odd that only malocclusion may be responsible for both outcomes without considering several other independent variables that are already established in the literature.

Authors may also consider subgroup analysis according to the different dentitions, such as only deciduous dentition, mixed dentition, and permanent dentition.

Discussion and conclusion

This is a cross-sectional study. It is not possible to conclude that any independent variable is a risk factor for the outcomes.

Authors fail to discuss important limitations of the present study, such as the absence of very important independent variables, and the not inclusion of important variables in the multivariate analyses.

Based on my previous comments, the following sentence may be mitigated: "The results of our study once again highlights that there are direct oral health risks associated with malocclusion
thereby justifying orthodontic treatment [11] and not just professional efforts of oral hygiene education.[10]

Additional reference #39 does not support the mentioned reference. Gingivitis is not associated with those conditions, periodontitis it is.

In this sense, it may not be reasonable to conclude that orthodontic treatment

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

No

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

No

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

No

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

**Quality of written English**
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published
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