Reviewer's report

Title: Contextual and Individual Assessment of Dental pain period prevalence in adolescents: a multilevel approach

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Reviewer: Anne Nordrehaug Astrom

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Review: Contextual and individual assessment of dental pain period prevalence in adolescents: A multilevel approach

This large scale cross sectional survey from Sao Paulo in Brazil describes determinants of period dental pain in adolescents aged 12 and 15 years of age. Independent variables were analyzed according to their assumed level of proximity to the outcome variable in hierarchical multivariable Poisson regression analyses. Moreover, an area based measure of Human development (HDI) was assessed and analyzed together with the individual level variables in multilevel regression analyses using STATA. The article is justified by referring to the absence of multilevel analyses in the dental literature. Overall I think this is an interesting article with potential to be published in BMC Oral health. However, I have some comments and questions that should be considered by the authors in a major revision of the current manuscript

1) The English writing should be improved considerably

2) The journal guidelines for how to prepare the manuscript should be adhered to (see for instance – figures/figure legends, the references, etc

3) Method section could be improved – particularly the sampling procedure could be described in more detail. How many students were eligible for study? What were the reasons for non response? Drop outs were compensated by adding individuals to the calculated sample sizes. On page 6 it says that the original sample size was enlarged by adding 1.565 15 yr olds. On page 5, 1565 15 yr olds were the total number of school children examined in the survey – this appears confusing - please clarify

4) Results: I miss a sample profile for this study

5) Table 1: shows the unadjusted associations between dental pain period prevalence (at the individual level ) and individual level socio-economic characteristics and dental status in addition to an area based measure of human development. What was the N in the analyses using HDI as independent variable?

6) Table 2 shows results from multilevel Poison regression using both aggregate and individual level variables as correlates of period dental pain in the same model.

I am not experienced with this type of analyses – however it seems strange the
PR for HDI was the same in table 1 and table 2 – that is both in unadjusted analyses and after having adjusted for several individual characteristics. To me that appears to imply that none of the effect at area level are mediated or taken account of by individual correlates. The authors should justify this whilst describing the results.

7) Finally individual level multiple variable logistic regression were conducted stratified by the area level measure of HDI. This is another feature that should be justified – to conduct analyses with individual level variables stratified by a variable measured at another level? Some interactions are indicated – between social context and age and type of school on dental pain. These interactions of effect modifications have not been tested statistically which should be recognized when writing and interpreting results.

**Level of interest:** An article whose findings are important to those with closely related research interests

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

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests