Reviewer's report

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

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Reviewer: WAEL SABBAH

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Contextual and individual assessment of dental pain period prevalence in adolescents; a multilevel approach.

This is an interesting and well written paper that addresses the contextual and individuals determinants of dental pain among Brazilian adolescents. However, I have some concerns about the paper and the methods.

Introduction:
• The authors should expand in their justification for using multilevel analysis to examine the contextual determinants of dental pain. The authors reported few studies which used multilevel analysis in relation to certain dental condition. Did the use of multilevel analysis in these dental studies explain more of the variation in oral health on top of that explained by the individual’s determinants?
• The objective of the study should state explicitly the contextual determinants that will be examined in the multilevel model.

Methods:
• It would have been useful to conduct the analysis in two steps, first at the individual level including all explanatory variables, second conduct the multilevel analysis including the level 2 variable (Human development index). This will inform us of the variation in dental pain explained by including level 2 on top of that explained by the individual’s determinants.
• The number of geographical areas included in level 2 analysis was not stated in the method or the results.
• The authors should explicitly indicate all the variables included in each regression model.

Results:
• Table 1 reports the prevalence of dental pain by individual’s characteristics and human development index. However, the table reports prevalence ratio, it is not clear whether these prevalence ratios reflect the results for unadjusted (binary) analysis or adjusted analysis. If these prevalence ratios were obtained from adjusted models, what were these models adjusted for?
• In the same table (1), for the variables (skin colour, income, father education and mother education), the authors stated a single p value for each of these
variables. What these p values reflect? Traditionally in a categorical variable a p value should be reported for each category of the variable.

• In Table 2 the authors claimed that the regression model was adjusted for human development index. However, the prevalence ratio for Human development Index in Table 2 was similar to that reported in Table 1. This is a mystery? How can a variable have exactly the same association with the dependent variable in two different regression models?

• In Table 2, again it is not clear how the regression model was conducted. Were all the variables in Table 2 included in one regression model, or did the authors include one individual variable at the time and adjusted only for Human Development Index?

• The authors should report how much of the variation in dental pain was explained by including level 2.

• In Table 3 the authors stratified the sample according to Human Development Index and conducted two different models of regression. The associations between most of the explanatory variables and dental pain lost significance in these two models. The authors claimed that this happened because the relationship between individual’s characteristics and dental pain was confounded by human development index. Did the authors consider that the lack of association resulted from using smaller number of individuals in the stratified regression models than that used in the original model reported in Table 2? If the contextual variable (Human development index) confounded the relationship between individual characteristics and dental pain, then this relationship should have disappeared in Table 2 since it was adjusted for level 2.

Discussion:

• Page 11, 2nd paragraph, the authors stated “As the outcome was relatively common statistical analysis used Poisson regression instead of multivariable logistic regression” this statement should have been made in the method section not in the discussion.

• Later in the same paragraph the authors stated that they stratified the analysis to assess effect modification and interaction. I do not recall reporting any interaction in the results.

• Page 12, 2nd paragraph, the authors stated that the use and availability of dental care should be associated with contextual environment. What is the reference for this statement? Even if this statement was valid in certain countries, is it applicable to the study population and geographical area. In fact one of the major limitations of the paper is the lack of adjustment for the use and availability of dental services.

Level of interest: An article of importance in its field

Quality of written English: Acceptable
Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests