Reviewer's report

Title: Oral health status of 12-year-old school children in Khartoum state, the Sudan; a school-based survey

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Reviewer: Jose Leopoldo Ferreira Antunes

Reviewer's report:

This is an interesting paper reporting a survey of dental caries in Sudan, and informing on previous dental information in that country. Dental surveys are usually performed in moments of (at least relative) peace and welfare; dental information on the Sudanese population is scarce, and the authors’ effort may be welcomed by the international literature. Authors reported having attended international guidelines of ethics in and provided information on the reliability of the gathering of data: training of the dental examiner in Sweden, intra-observer kappa statistics (0.83) acceptable for this aim.

The reader may be impressed by the relatively low average of DMFT. Modifications of diagnostic criteria used in the past and usual factors for underestimation of caries in surveys using the methodology standardized by the WHO (natural light, overlooking small and proximal cavities) would not be enough to explain such reduced result. However, the prevalence of caries is indeed reduced, and may have declined as acknowledged by authors (p.12). Which factors might have contributed to this decline (or this reduced prevalence)? The explanation provided by the authors is somehow contradictory.

The multivariate model (table 3) is poorly explicative. Nagelkerke R² was too reduced (0.013) to support the model, the index for socioeconomic status (SES) was the only covariate significantly associated with DMFT>0, and the prevalence of caries was higher for children with higher SES. Authors interpreted that “children with higher SES may be able to purchase more sugary snacks” (p.14). However, the high proportion (76%) of caries-free children was attributed by the authors to an improved nutritional status and awareness about oral hygiene (p.12). These statements are somehow contradictory: if nutrition improved in Khartoum, why would the better-off present a poorer nutritional status?

Authors refrained from presenting information on nutrition and hygiene habits as possible explanations of the low DMFT. As long as I can anticipate, no question on dietary habits was included in the questionnaire. Tooth-brushing was discriminative in the sample: 64% reported brushing at least once a day, 25% twice 5% more than twice a day (p.8). Almost all (97%) of those who brush used toothpaste: are you referring to fluoride toothpaste? Why covariates on tooth-brush were not included in the bivariate and multivariate assessment of associations (table 3)?

Authors may want to improve their explanatory model by including some aspect on nutrition and tooth-brushing. If this is not feasible, authors should
acknowledge the limitation of the study, which exclusively described the low prevalence of caries, though is unable to explain or to propose explanatory hypotheses.

The following observations also refer to the usefulness of the model:

1. In Khartoum city, 12% of schoolchildren are enrolled in private schools; I presume that this proportion may not be much higher in the remaining surveyed sites of the Khartoum state. Indeed, when results were adjusted to consider the sample design, results got closer to those presented by children in public schools. This observation suggests that the sample unnecessarily overrepresented children in private schools (almost 50%). Any thoughts?

2. Cross-sectional studies should consider the use of Poisson regression instead of logistic regression analysis (Barros AJ, Hirakata VN. Alternatives for logistic regression in cross-sectional studies: an empirical comparison of models that directly estimate the prevalence ratio. BMC Med Res Methodol 2003; 3: 21). It is advantageous to present the prevalence ratio instead of the odds ratio, and the assessment of associations is expected to present analogous results. Authors could use the command `xi:poisson` (suffix `irr` to report prevalence ratios) of Stata 10, instead of the command `xi:logit` (suffix `or` to report odds ratio). Additionally, the same option of using the the command `svyset` and the prefix `svy` to correct for sample design can be applied.

Discretionary Revisions:

1. SiC (and not SCI) stands for the acronym for the Significant Caries Index.
2. Please provide the reference for Landis and Koch (1977).
3. The D in DMFT stands for Decayed (and not for Decay).
5. It is not usual to ask for 12-year-old children to inform on their parents’ educational level and other SES aspects; maybe this methodological option should be acknowledged as a limitation of the study?

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests.