Author's response to reviews

Title: BMI and dental caries in children and adolescents: a systematic review of the literature

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Author's response to reviews: see over
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Dr Devan Kansagara,
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Re: MS: 213486655663594 BMI and dental caries in children and adolescents: a systematic review of the literature

Dear Dr Kansagara,

We thank you for your thoughtful feedback on our earlier draft and appreciate the opportunity to resubmit for your consideration. We have endeavored to address each of your concerns as set out below.

Kind regards,

Merrilyn Hooley

Introduction

1) Please clarify the relationship between your review and the Kantovitz review. Page 3, para 2 is confusing - according to this, the majority of the studies in the Kantovitz review did not evaluate association of BMI with dental caries. I am guessing they searched more broadly across both adult and pediatric populations for any studies examining the relationship between any measure of obesity and dental caries. It seems to imply – but not state outright – that your review examined the relationship between BMI and caries.

- Yes that is correct. The majority of papers originally identified by Kantovitz et al. were not original papers, or did not test the association between dental caries and obesity. Furthermore the search terms used in Kantovitz et al.
(2006) were limited to 'obesity' and "dental caries", and included adult and paediatric samples. Our search terms were extensive, including various terms to represent body weight: ‘BMI’, '*weight’, and 'obesity’ and dental health: 'caries', 'dental health', 'oral health', 'dmf*', 'tooth decay', 'cavit*'. Our review also followed PRISMA guidelines which were not followed for the Kantovitz et al. review.

- We have inserted the following information as a footnote:

  The current review differs from Kantovitz in three ways: (i) it seeks to review papers published between 2004-2011, (ii) it follows PRISMA guidelines, and (iii) a greater range of search terms relating to weight and dental caries were included (e.g., BMI, *weight, obesity; oral health, decay).

2) As both reviewers suggest, please be explicit throughout the manuscript about whether you are assessing the relationship between BMI and caries, or obesity and caries. Though the title suggests otherwise, the manuscript and the findings you focus on are more in keeping with the former.

- Thank you; we have made the appropriate corrections throughout the document to clarify our interest in the association between BMI and dental caries.

3) The second key question you pose is not fully addressed in the manuscript and seems beyond the scope of the current manuscript. It would be reasonable to eliminate this as a key question and to preserve the information re: these other risk factors in the tables and discussion.

- Thank you; we have followed your recommendation. The second key question has been removed as an aim, but retained informally in the tables and Discussion.

Methods

4) One of the paper’s main findings is that high BMI and low BMI may be associated with caries. You suggest the link between low BMI and caries may reflect an association between malnutrition and caries. The search strategy accounts for obesity, but not malnutrition. If possible, conduct a “forensic search” to see if the addition of terms related to malnutrition would have yielded potentially relevant articles. If it is not feasible to do so, at least discuss this as a potential limitation.

- Thank you for this suggestion. We conducted a forensic search for papers published between 2004-2011 using OR 'malnutrition OR malnourish*' as search terms in addition to our original dental search terms. The same selection criteria were used to select papers for review. 567 papers were
originally identified in the searches, with 428 remaining after duplicates were removed. 402 papers did not meet the inclusion criteria and 26 abstracts were assessed for inclusion. A further 19 papers were excluded for not meeting inclusion criteria, and 7 papers retrieved to read in entirety. Two papers could not be translated (written in Persian and Chinese) and five papers failed to meet inclusion criteria. Thus no additional papers were included following the forensic search.

- We have included this information as a limitation of the review. We have attached a copy of the forensic search results to the end of this document for your information but have not included it in the manuscript. We are happy to do so if you require it.

We have noted the omission of the term ‘malnutrition/malnourish*’ in Discussion as a limitation and noted the results of our forensic search.

5) Please reconcile search date information in abstract and body of manuscript as noted by reviewer 2.

- Thank you; this has been done.

6) Please clarify whether and how your search strategy differed from the Kantovitz review.

- As noted under point 1 above, we have now addressed this shortcoming.

7) Please provide a more thorough description of methodologic quality assessment. Methodologic assessment is focused on characteristics of the dental examination, but there are a number of other characteristics which will impact the quality of an observational study including measurement of predictive factors (obesity), cohort definition, adequacy of follow-up, and assessment of important confounders. There are tools available to help guide observational quality assessment – for example, consider using the Newcastle-Ottawa tool (http://www.ohri.ca/programs/clinical_epidemiology/oxford.asp).

- We have attempted to provide a more thorough description, as guided by the Newcastle-Ottawa Scale. Each study was evaluated across a number of criteria including representativeness of sample, quality of assessment of outcome variables (i.e., child BMI and dental caries), and whether any attempt was made to control for possible confounds. This information has been summarized in a table and included as Appendix A. Studies were ranked on the basis of their score across these four criteria and five A-ranked studies identified. These studies are discussed in detail at the beginning of the Results section.

Results
8) As reviewer 1 suggests, the results should be presented in a more straightforward manner. Much of what is currently in text is already described in each table. Rather than reiterating the table information, we would like to see a synthesis of table findings and what this means in terms of the relationship between BMI and caries. The discussion outlines some potential explanations for discrepant findings across studies, but the data to support these hypotheses could be fleshed out in the results. For example, were more of the studies finding an association of better quality, or did results differ depending on setting (ie – fluoridated water)? What did the highest quality studies find?

- We endeavored to address this concern in our last revision by identifying and analyzing emergent patterns that distinguished between the studies that found different results. This information was summarized in Table 5 and the results of a series of data analyses were reported. We then drew on this evidence in the Discussion section. We believe that this information is important and informative for future study design. However we have again revised the Results section to reduce description and increase synthesis and interpretation.

9) You go on to discuss the potential impact of socioeconomic status (among other variables) on caries incidence. Please clarify in the tables, perhaps with footnotes, whether the key findings for each study reflect multivariate adjustment or not. If so, what factors did they adjust for?

- We have included this information in the new Appendix A

10) There is little information about the magnitude of association between exposure and outcome – please provide this information in the table when available.

- Very few papers reported effect sizes. This information has been included in Appendix A.

11) The term obesogenic risk factors may be confusing to readers, both because it may be an unfamiliar term and because it is used to mean different things in the text and in tables. In the tables, this column seems to refer to the key findings (in which case, please label as such). In the text (both results and discussion), the term seems to refer to potential confounders. Please re-label the obesogenic risk factors section in the text as something like “confounding factors” or “other potential risk factors”, and keep the key findings up front in each of the subsections of the results.

- Thank you for this suggestion; we have relabeled these columns ‘Key findings’.
Discussion

12) The brief summary of findings at the beginning of the discussion is not supported by the results. In other words, it is not at all clear from the presented results that dental caries is associated with BMI – almost half the studies found no relationship. Please re-write discussion to match the results. It seems more accurate to say something like “Across 46 studies examining the relationship between BMI and caries, about half found no relationship. The studies that did find a relationship suggest that children with both high and low BMI are at risk for dental caries.” The concluding paragraph and abstract also need to be amended to more closely reflect the review results.

- The Discussion has been rewritten in keeping with your recommendations.

13) Page 13, para 2, page 14 para 1 – see comment #7. These suppositions could be better supported by the actual findings by more clearly presenting this information in results.

- Thanks you; we have rewritten the Results and Discussion sections to address this shortcoming.

14) You do not need to re-pose the initial key questions in the discussion.

- We have removed the key questions from the Discussion.

We thank you for your valuable suggestions. We have attempted to address each of them and apologise for the delay in returning the revised manuscript.

Kind regards,
Merrilyn Hooley
567 records identified through Medline, ISI, Cochrane, Scopus, Global Health and CINAHL databases libraries

428 records, after duplicates

428 records

26 abstracts assessed for eligibility

19 articles excluded based on abstract, because they were reviews and/or editorial papers or did not meet selection criteria (e.g. involved sample over 18 years of age, did not assess caries, did not assess BMI and/or did not assess the association between dental caries and BMI).

7 full-text articles assessed for eligibility and included in the systematic literature

5 full texts excluded because did not meet selection criteria (e.g. did not assess caries, did not assess BMI and/or did not assess the association between dental caries and BMI). Another 2 papers are not written in English but are not translatable: One is in Persian, the second in Chinese.

0 studies included in the systematic literature review